

# The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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## Machinery Foundations.

In an article on "Foundations," contributed to the *Paper Trade Journal*, we find the following interesting particulars:

In every well-regulated physical laboratory are to be found nearly as many demonstrations for determining characteristics governing the foundations of mills and factories as for all other mechanical appliances combined. The power as well as number of engines has increased enormously during the past few years. The substitution of iron for wood and the enlarged size of all machinery have more than doubled the weight to be driven. The growing use of revolving fans, of centrifugal dryers and of dynamo-electric machines has brought into requisition a higher speed as well in motors as in shafts, counter-shafts, pulleys, drums and cog-wheels. The work required of steam hammers, ore crushers, stamps, punches, shears, rollers, slotters and presses is constantly increasing; hence the buildings in which these machine tools, motors and machinery are operated are becoming more and more massive and lofty.

Each and all of these conditions is a source of instability, and serves to either increase the number or amplitude of the vibrations produced, if it does not increase both, until they become an annoyance to visiting customers, no little interference to operators, clerks and draftsmen, an injury to the building and a nuisance to the neighborhood. Foundations of the walls are underpinned, the walls themselves are buttressed, floors are deadened and false ceilings are put in, but these undesirable features continue unabated. Their cure does not lie there. Too frequently the trouble is ascribed to the material which serves for the foundation for the engine, or the heavy working or the rapid revolving machinery. Bricks or dimension stone set in mortar or broken stone of varied or uniform size mixed with hydraulic cement are the materials of which foundations are usually built, but are they the best is the question.

Of all the industrial arts known to the ancients those which have made the least progress are building and road-making, and those massive structures erected in Egypt and India still remain without a modern rival, and the roads to no modern city are equal to those by which the Roman drove to his capital. Only recently has it been shown that asphalt is the best material for much-traveled roads, and there is no reason to believe that its application to that purpose, as well as to building, was not well known to the people of antiquity. We have the best of authorities showing that the Romans, as well as the Assyrians, were familiar with the uses of bituminous cement. Leon Malo long ago determined that a mixture of asphalt and gravel, molded in small pieces, did not soften when subjected for weeks to the hottest summer sun, and he successfully erected a block of similar material which served as the foundation for a horizontal engine of 50 horse-power. This massive block has been analyzed and found to consist of stone broken to unequal size, the interstices being filled up with material the same as asphalt. This block became so hardened with age as to be broken up with the greatest difficulty, and the fracture was as clean as that of the finest sandstone rock. For more than 20 years this engine ran regularly, without the least indication of yielding a particle, even under the cylinder.

Some years ago the writer saw a powerful stone-breaker working in the city of Paris, and the foundation was ordinary masonry. The surrounding ground was shaken so much that an engraver on glass, carrying on business two squares away, suffered a great inconvenience, being unable to finish his work. After the proprietors of the stone-breaker had been served with a temporary injunction they had the masonry removed and one of asphalt substituted, and upon testing the machine found that no tremor existed, and the artisans pursued their avocations, thinking the injunction was still in force. Asphalt is a very simple mineral of a calcareous character, naturally impregnated with bitumen in various proportions, say from 6 to 18 per cent. The limestone is in the form of small grains, each one of which is coated with a small pellicle of bitumen, which serves to agglutinate them. The asphalt being heated and agitated for a few hours a semi-fluid mass is obtained, which, when mixed with gravel, makes the best of foundations and roads.

For the foundation of heavy engines and machinery a casing the exact size of the intended foundation is made of tongued and grooved boards, the smooth side inward. This may be hooked, strapped on the corners or stiffened by struts attached to it on the outside, as its height and capacity may render necessary. If adhesion between the casing and asphalt is feared the casing may be lined with thick paper or coated with whitewash or clay and water. Thus prepared it may be filled with the foundation materials. In the constantly increasing cases where mixed masonry is a main consideration the mixed system is to be preferred. By this plan the center of the foundation may be built of ordinary masonry, dimension stone being employed, and when this has become thoroughly dry the space between the stonework and the casing may

be filled with either asphalt beton or asphalt masonry, and the whole carefully surfaced with asphalt. Foundations for any machinery built in the foregoing manner may be considered absolutely non-vibrating; in fact, in this respect they have long since passed the experimental period, inasmuch as a score or more years' test under the most trying and adverse circumstances prove the superiority of these foundations above all others, not only as preserving the life of the

railroads, as is well known, has been greatest in Great Britain, being there \$205,842 per mile of roads; for the Belgian State railroads it is \$123,986; for the French State railroads, \$124,642; for the German State railroads, \$105,204; for the German private roads, \$71,877; for the Austro-Hungarian roads, \$104,420. The cheapest system of Europe is the State railroads of Finland, \$30,102; the other Russian railroads stand at \$82,244, against \$63,250 per mile for the

tubes into the back connection are carried by the return tubes through the upper section of the boiler to the smoke-stack. The objection sometimes raised to a brick-lined furnace in a portable boiler that there is a loss of heating surface is rather apparent than real. In the furnace of the ordinary portable boiler the crown sheet is the only really effective heating surface, since in the side walls there is a poor circulation of the water. In the portable boiler as usually

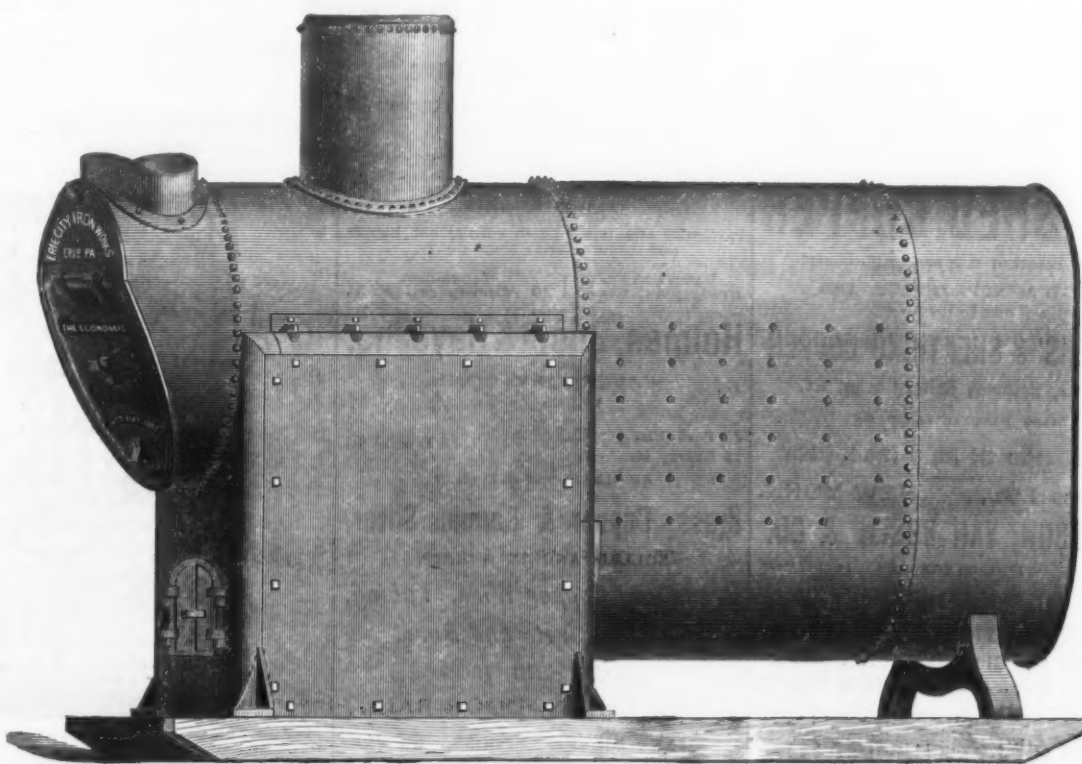


Fig. 1.—General View.

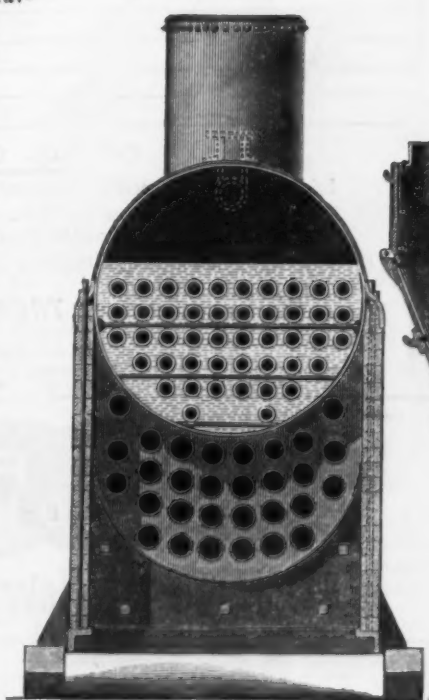


Fig. 2.—Cross Section.

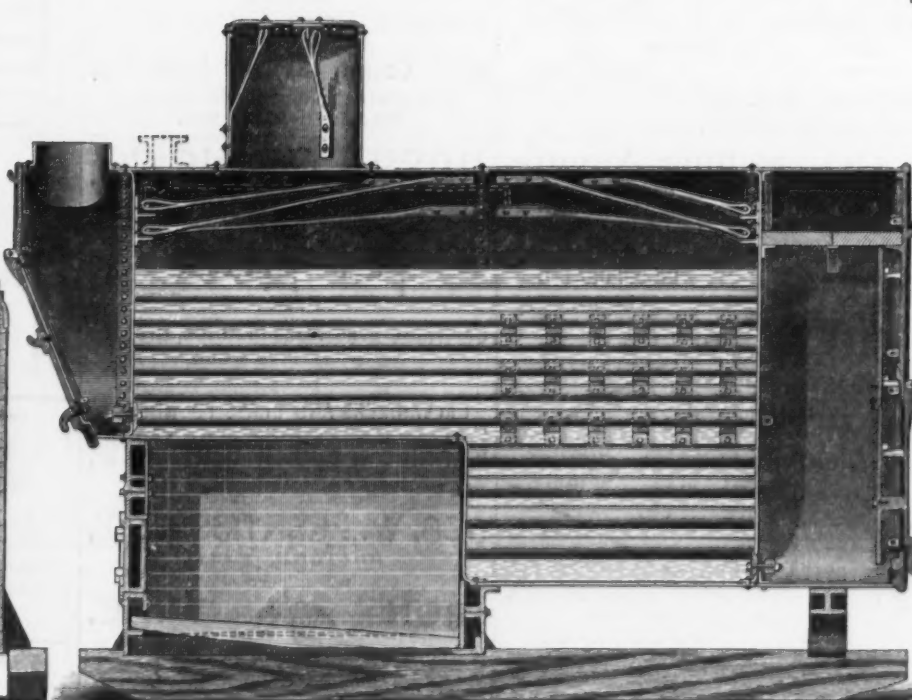


Fig. 3.—Longitudinal Section.

RETURN TUBULAR PORTABLE BOILER, BUILT BY THE ERIE CITY IRON WORKS, ERIE, PA.

building, machinery and the like, but as a saving of power otherwise lost in vibrating friction.

**The Railroads of the World.**—The *Archiv für Eisenbahnen* gives statistics of the railroads of the world, prepared for the most part from official sources, making the aggregate length 290,750 miles at the end of 1884, of which no less than 62,788 miles have been opened since 1879. Of this there were in the several grand divisions of the world:

	1884.	1880.	Increase.	P. c.
Europe.....	117,694	104,936	12,758	12.5
Asia.....	12,737	9,935	2,802	28.4
Africa.....	4,075	2,842	1,233	43.4
America.....	143,788	105,766	38,022	40.6
Australia.....	7,498	4,844	2,654	54.5

Of the 290,750 miles of railroad in the world no less than 174,016, or 60 per cent., are in English-speaking countries. The countries which have the greatest mileage in proportion to population or the smallest number of inhabitants per mile are Australia (364 people per mile), the United States (460) and Canada (486). Even the Argentine Republic has a smaller population per mile than any European country, namely, 1000; while in Europe, Sweden, which has fewest, has 1113; Great Britain and Ireland, 1870; Germany, 1983; France, 1943; Belgium, 2106; Austria-Hungary, 2786. The cost of

railroads of the United States. The whole cost of the railroads of the world has been more than \$24,000,000,000, which, however, is only about \$24 per inhabitant. In this country the expenditure has been about \$133 per inhabitant; in Great Britain, \$107; in Germany, \$47; in France, \$57; in Austria-Hungary, \$33; in Italy, \$19; in Belgium, \$41; in Sweden, \$25; in Spain, \$29; in Russia, \$14; Canada, \$89.

## Return Tubular Portable Boilers.

We present in the engravings on this page different views of a return tubular portable boiler built by the Erie City Iron Works, of Erie, Pa. The front end of this boiler is cylindrical in form and extends over the furnace, while the rear end is oval, the lower portion extending below the cylindrical part far enough to hold the short tubes leading from the furnace to the back connection. The furnace is brick-lined and can be readily detached from the boiler when desired. The fire-brick lining is held in place by iron rods which are protected from the fire and can be easily removed and replaced when necessary. The furnace is large, with ample grate surface. The products of combustion passing through the short

made the furnace is a great source of expense and danger; it is the most expensive part of the boiler to build, the part most liable to give out, and the most expensive to repair. The flat crown sheet, always subjected to the greatest heat, has the least water to protect it. The sides of the furnace are ready receptacles of sediment, and are difficult to clean. In the boiler which we illustrate the case is reversed; the furnace is the cheapest part of a boiler to build and repair, and there are no sides to fill with mud and burn out, or flat crown sheets to be exposed by low water. The crown sheet is fully protected, and the boiler combines with the safety of the stationary return tubular the convenience and portability of a portable boiler. It occupies but little space, and is a rapid steamer. The crown sheets are homogeneous steel. In the smaller sizes the furnace plates are extended under the grates to form an ash pit, but all the larger sizes are made with open bottoms. When an engine is mounted on the boiler the dome is left off and a dry-pipe substituted, as shown by the dotted lines in Figs. 2 and 3.

In 1883 the production of Thomas iron in Germany was 369,685 tons of 1000 kg., while in 1884 it was 438,746 tons, and last year no less than 668,065 tons.

## Determination of the Calorific Power of Fuel.

Mr. William Thomson, in a paper read before a Manchester (England) scientific society a short time since, described an apparatus recently devised by him to determine the heating power of different coal samples. The method which he follows consists in burning the coal in oxygen. The apparatus, briefly described, is made up of a stand furnished with four upright brass springs. These are strips of brass fixed to the stand at the bottom and curved upward and inward. In this stand is fitted the bowl of an ordinary clay tobacco pipe rather less than  $\frac{3}{8}$  inch internal diameter by  $1\frac{1}{2}$  inches long. This is used as a stand for a small platinum crucible  $\frac{3}{8}$  inch diameter by  $1\frac{1}{2}$  inches long, because the clay is a non-conductor of heat and would not injure the platinum when heated to redness. Into this platinum crucible is introduced 1 gram of coal in a fine state of division, which is ignited, after being placed on its stand, by a fuse, and the whole covered by an inverted wide glass test-tube 6 inches long by  $1\frac{1}{2}$  inches diameter, to the bottom of which was attached a piece of narrow tubing 1 inch long by  $\frac{3}{8}$  inch in diameter. Over this tube is drawn a piece of india-rubber tubing, the free end of which is turned over on itself, and through this rubber is passed a glass or thin copper tube (preferably the latter) terminating with a stop-cock. The fuse is prepared by soaking two or three strands of ordinary lampwick in nitrate of potash solution and drying. About  $\frac{3}{4}$  inch of this fuse is placed upright in the mixture.

When the fuse is ignited the mouth of the test-tube is pushed over the brass springs, thus inclosing the platinum crucible containing the coal, on the diving-bell principle, and the whole is then sunk into the cylinder, containing either 1934 or 2000 gram. of water, the temperature of which has previously been taken by a delicate thermometer. A stream of oxygen from a gas holder or gas bag is then allowed to flow slowly through the test-tube downward, making its escape at the mouth and bubbling through the water. It is necessary to commence the combustion by having the movable tube which penetrates the bottom of the test-tube drawn well up, so as to have a complete atmosphere of oxygen in the test-tube until most of the volatile matter of the coal is consumed. The movable tube is then gradually pushed down till it comes to the mouth of the platinum crucible; a slow circular movement is then given to it by the hand till the whole of the fixed carbon of the coal is consumed, which is rapidly done under the stream of oxygen impinging on it. The ash is then left as a number of fused globules, many of them adhering to the crucible, having been completely fused by the intense heat of the combustion. The water is then allowed to enter the tube and come in contact with the hot crucible and tobacco-pipe support and entrance tube for the gas to abstract the heat left in them; the whole of the water is then well mixed and the temperature again taken, the difference between the two temperatures being the heat given to the water by the combustion of the coal. Mr. Thomson has found that the temperature of the water is practically not altered by passing about 3 gallons of air or oxygen through it, that being in excess of the quantity required to burn the coal, between  $1\frac{1}{2}$  and 2 gallons being actually required.

By this method it is not necessary to deduct or add to the result obtained. The rise for each gram of good coal is somewhere about  $6^{\circ}$  to  $7^{\circ}$  F. for the 1934 gram. of water, that being equivalent to about 11,500 to 13,500 units of heat. Graphite burns away quite easily in the oxygen apparatus. During the time the experiment is being made Mr. Thomson finds it necessary to have the cylinder containing the water resting on three pieces of cork in a loosely fitting vessel of bright tinned iron plate, having a slit 7 inches long and 1 inch wide cut down one side, through which the combustion can be observed. This vessel practically prevents loss of heat from the water if it is above the temperature of the surrounding air, vice versa if the temperature of the water be lower than that of the air, but Mr. Thomson prefers to have at hand a large supply of water which has been exposed to the atmosphere for some hours, in order that its temperature may become as nearly as possible the same as that of the air.

The Belvidere iron mines, near the New Jersey town of that name, some years ago abandoned, have been reopened by a company of New York capitalists, the water pumped out, and the work of raising ore recommenced. A shaft sunk by the company on leased lands adjoining has developed a bed of ore of desirable quality for conversion into Bessemer steel. A branch has been built to connect the mines with the Lehigh and Hudson River Railroad. Active operations have also been commenced at the Wallace mines, 6 miles north of the Newfoundland station, on the New York, Susquehanna and Western Railroad. New shafts have been opened on the vein, and a branch railroad is projected. It is understood that Cooper & Hewitt are interested in these mines.



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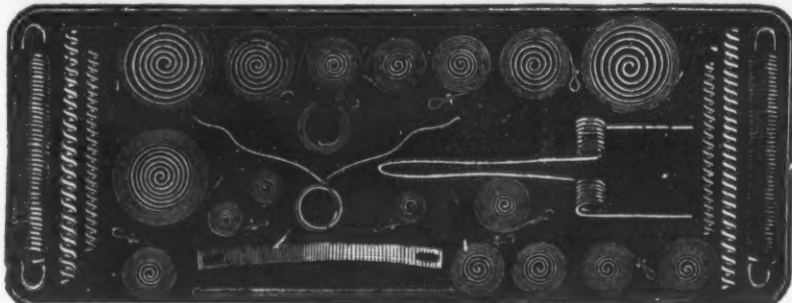


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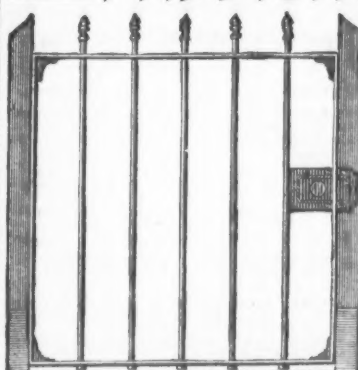
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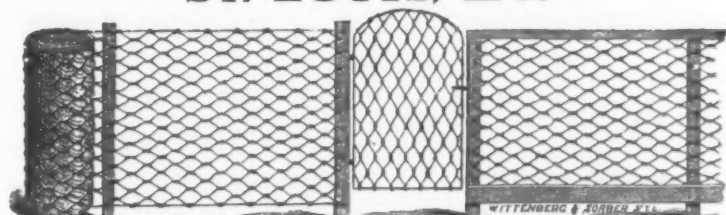
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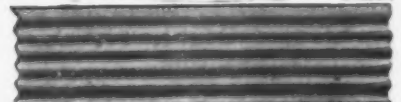
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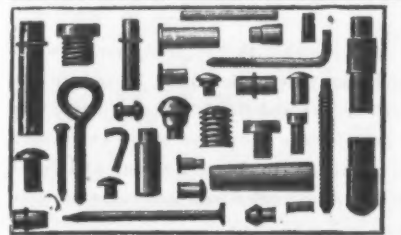
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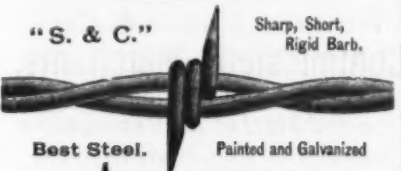
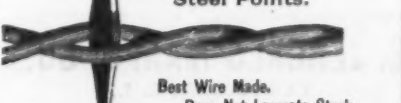
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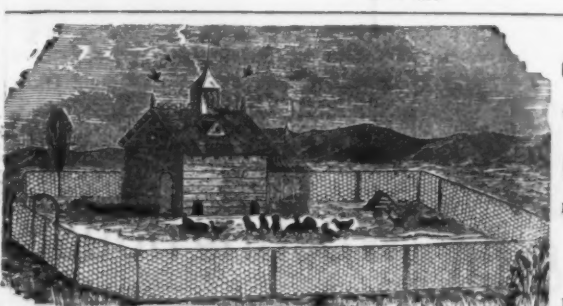
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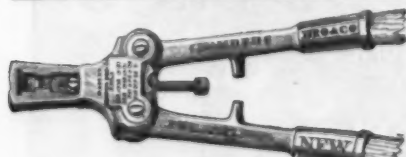
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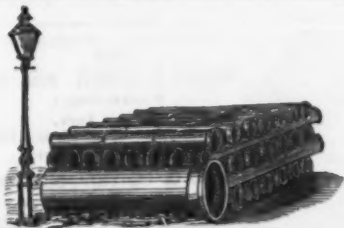
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**Latest Legal Decisions.**  
TELEPHONE COMPANY—RIGHT OF STATE TO  
REGULATE.

A statute was passed to regulate telegraph and telephone companies, and in the second section it was provided that "every telephone company with wires partly or wholly within the State, and engaged in a general telephone business, shall, within the local limits of the company's business, supply all applicants for telephone connections and facilities with such connections and facilities, without discrimination or partiality, provided such applicants comply or offer to comply with the reasonable regulations of the company." These connections and facilities having been denied to a proper applicant, he applied for a writ of mandamus to compel the company to comply with their statutory duty, and a judgment was entered granting the writ. The company carried the case—Central Union Telephone Co. vs. State—to the Supreme Court of Indiana, where the judgment was affirmed. The Chief Justice (Noble), in the opinion, said: "This company have become and are common carriers of news in the sense in which a telegraph company are common carriers—that is to say, that since their organization their business has been, and it still is, to carry telephonic messages over lines of wire erected for that purpose and set apart for what is in effect a public use. And they were such common carriers when the statute in question, the constitutionality of which is assailed by the company, went into effect. That the business of a common carrier of whatever class is a public employment, and that a common carrier is required to serve all, so far as it is able to do, and that, too, with substantial impartiality, are legal propositions too well established, to require the citation of authorities, and these legal relations of common carriers to the general public were held—correctly, we think—to be applicable to telephone companies doing a general telephone business in the State. The section of this statute herein set out, so far as it effects any question involved in this cause, is little, if anything, more than a statutory extension of the law applicable to common carriers generally to telephone companies doing a general telephone business, and as such telephone companies are common carriers independently of any statute, and, as common carriers are proper subjects of legislative control, we can see no objection to the validity of this section."

**LIABILITY TO ADJOINING OWNER.**  
O. in building on his lot in San Francisco used such quantities of gunpowder that the dwelling of C., on an adjoining lot, was seriously damaged by the explosions. An action was brought to recover for the injuries caused—Colton vs. Onderdonk—and the plaintiff had a judgment. The defendant appealed to the Supreme Court of California, where judgment was directed for \$7500, a slight reduction from that given below. Judge Foot, in the opinion, said: "The fact that the defendant used quantities of gunpowder, a violent and dangerous explosive, to blast out rocks on his own lot, which was contiguous to that of another in a large city, must be taken to be an unreasonable, unusual and unnatural use of his own property, which no care or skill in so doing can excuse him from being responsible to the plaintiff for the damage he actually did to his dwelling-house as the natural and proximate result of his blasting. For an act which in many cases is in itself lawful becomes unlawful when by it damage has accrued to the property of another. And it would make no material difference whether that damage resulting proximately and naturally from the act of blasting was caused by rocks thrown against the dwelling-house, or by a concussion of the air around it, which had either damaged or had entirely destroyed it."

**LABEL OF PARTNERSHIP—EVIDENCE OF MENTAL SUFFERING—JOINT ACTION.**  
C. published a circular which was sent to the customers of a firm—Donaghy Brothers—in which he stated that in his experience with the firm he found them "not worthy of our support." He declared that they had been guilty of "base treachery" and of "foul and unfair dealings." In the circular C. stated: "I have been in the habit of buying nearly all my goods of them for years, but because I quit buying of them they went to the Middletown Savings Bank, of which I rented my place, and offered \$10 a month more than I was paying; and, after getting their lease of the premises, served a notice on me to immediately vacate." On the trial the plaintiffs were permitted to give evidence of the mental pain and distress of each of them. In this case—Donaghy vs. Caffey—the plaintiffs had judgment, and the defendant appealed to the Supreme Court of Errors of Connecticut, where he succeeded in reversing the judgment of the court below. Judge Loomis, in the opinion, said: "The circular assails the firm of Donaghy Brothers only, and the plaintiffs should not have been permitted to introduce evidence of any injury to their private feelings; they could recover only for injury done to the firm. A complaint for a distinct libel on plaintiffs as individuals could not be sustained; each person libeled must sue separately. This circular must be construed as one declaration in all its parts, and when this is done the severe epithets applied to the plaintiffs lose all their force except as they attempt to characterize a single transaction, which is manifestly referred to as the sole foundation for all the statements made. Now all this is a perfectly lawful transaction, whatever its intention was; and how can we legally presume from such a statement that the plaintiffs were thereby degraded in the estimation of acquaintances or the public, or that they suffered loss in character, property or business? Leaving out the epithets which express the defendant's opinion as to the transaction he relates, there are no libelous statements, in themselves, in the circular. They may have injured the firm, but to recover therefor they must set out the damage sustained. This has not been done; they have complained only that they were injured by the statements made in the circular. We should add that where a defendant proposes to justify a libel by showing its truth he must plead its truthfulness specifically."



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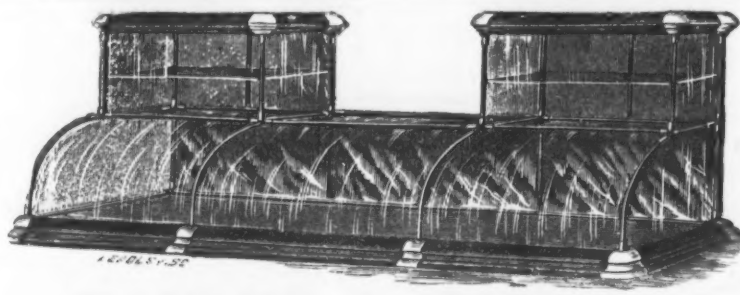
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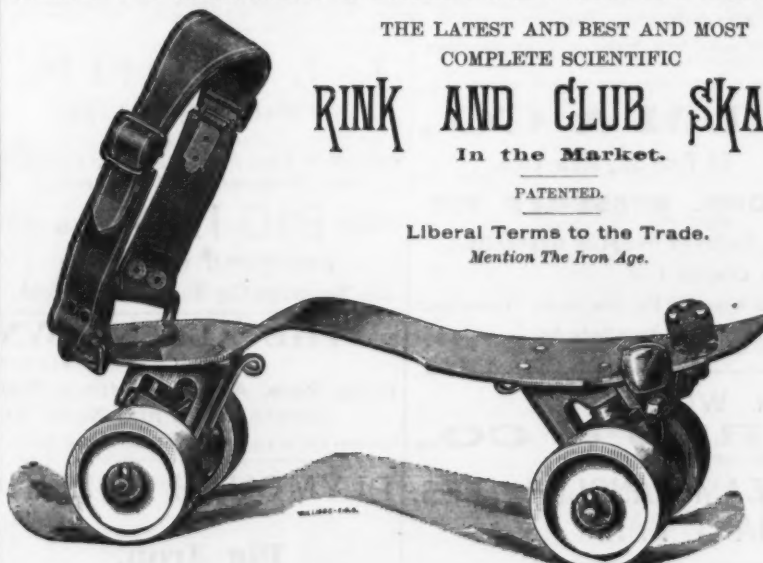
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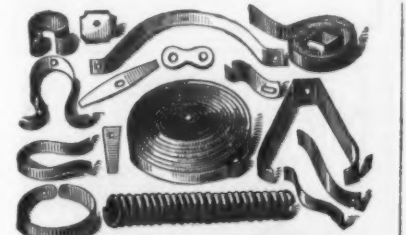


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Fig. 120.



Fig. 365.



Fig. 200.



Fig. 70.

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the view of great elasticity, durability and power. They produce  
a continuous pressure from the point where the door is wide open  
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IRON LEVELS.****A Speech by the English Tin King.**Mr. A. Strauss, of London, who is recog-  
nized as the leading tin speculator in the tin  
markets of the world, had the ambition to  
become a member of Parliament for Corn-  
wall. In pursuance of this plan, which has  
since been defeated, Mr. Strauss was present  
at the meeting of the Dolcoath Co., the  
most prosperous Cornish tin mine, and  
when called upon unbosomed himself in  
the following speech on tin:The thing we have to inquire into is supply  
and demand. I have no doubt you all  
know that last year we got as much tin as  
we consumed. The consequence was at the  
end of the year we had the same total visible  
supply as at the beginning of the year.  
This year the matter is different. From the  
Straits we get about the same as last year,  
perhaps a little less, but I do not think there  
is much difference. Australia has been di-  
minishing its production for the last two  
or three years, and we shall get this year about  
1000 tons less than last year. (Applause.)  
Consumption this year will be at least from  
2000 to 2500 tons more than last year. (Ap-  
plause.) This is owing, in the main, to an  
increase in the manufacture of tin plates  
and to other causes. The result of it is that  
we get 1000 tons less than last year, and we  
consume 2500 tons more than last year. (Ap-  
plause.) There will therefore be at the end of  
the year a deficiency of tin from 3000 to 3500 tons.  
(Applause.) Now, gentlemen, we are, unfor-  
tunately, in very depressed times. There is  
no spirit of enterprise, there is no specu-  
lation, there is no spirit of any kind in the  
London markets or anywhere else, and  
capital will not come forward to be invested  
in any kind of produce. I can name to you  
a dozen articles which are in quite as good  
a statistical position as tin, and which to-  
day are at as low a price as they have ever  
been in. Thus, my firm belief is that if it were  
not for extreme circumstances tin to-day  
would share the same fate as all the other  
articles. But, unfortunately, tin forms a  
glorious exception. (Applause.) It is a  
small article which can be easily manipu-  
lated. (Loud laughter and applause.) So it  
can—(renewed laughter)—as I know to my  
benefit (more laughter). And I will tell  
you what happened. About 12 months ago,  
when tin went down from £82 to £72,  
partly through large sales of large holders,  
partly through "bears," a certain firm  
which shall be nameless hung up all the tin.  
They secured the whole stock here and  
abroad; they put it up to £90 and £92, and  
kept it there for 12 months. Now, what  
happened in those 12 months? There is no  
doubt that the price of £90 is a very remu-  
nerative price to all foreign producers, and  
in these times of depression, when capital  
cannot find profitable employment, when  
labor is sure to be attracted to any part  
where good wages are given, in spite of all  
these advantages we do not get any more  
tin from the producing countries. There is  
only one conclusion to be arrived at—that  
the tin is not there, or if it is there they  
cannot send it. (Hear.) We are therefore  
in this position that we know that the  
higher prices for tin do not give us any more  
supplies. About a month ago we put up the  
price another £10 per ton, and there is no  
sign whatever of any increase in production  
—no sign whatever of any decrease in con-  
sumption. (Applause.) The consumers pay  
this price with the greatest ease, and we  
have no difficulty, none whatever, in secur-  
ing it. (Hear, hear.) How far it will be  
desirable to put it up further depends on  
circumstances which are difficult to explain  
in this room. (Loud and prolonged laugh-  
ter and applause.) I wish to call your at-  
tention to this: We have still 12,000 tons  
of tin in stock. There is a deficiency every  
year of 3000 tons in round numbers. Sup-  
pose these 11,000 or 12,000 tons were in the  
hands of the market, that they could be  
bought by the consumers, we should have to  
wait three or four years before we should be  
the "bears" of tin. Within three or four  
years no one can tell what will happen.  
Therefore, in these times of depression, we  
should very likely fare in tin the same fate  
as in other articles that are so low. You  
can draw your own conclusion. You know  
more than all the brokers in London. I  
have parted with all my secrets to you.  
(Hear, hear and applause.)Wood Wool.—For some time past atten-  
tion has been directed to a very interesting  
product consisting of extremely thin and  
slender shavings of wood that are compar-  
able to paper cut for packing. It is known  
by the name of "wood wool." This product  
was first introduced into France as a pack-  
ing material. It weighs about 40 or 50 per  
cent. less than the materials generally used  
for such a purpose. Its beautiful appear-  
ance, its fineness and its extreme cleanness  
at once brought it into favor with shippers.  
It was afterward found that the material  
was well adapted for the manufacture of  
mattresses, for bedding for cattle, for the  
filtration of liquids and for stuffing horse  
collars, &c., the most suitable species of  
wood being selected for each of these pur-  
poses. Its elasticity causes it to be consid-  
ered as the best material for bedding after  
horsehair, and it is even preferable to any  
other substance when it is derived from  
resinous wood, since it does not then absorb  
moisture. In workshops wood wool is tend-  
ing to replace cotton-waste for cleaning  
machines, and it has likewise found an  
application on the rolling stock of railways  
for lubricating car axles. While it has the  
same property that cotton-waste has of  
absorbing oil it costs to times less than that  
material. Its use is said to be rapidly grow-  
ing in Austria and Germany and also in  
France.The Bethlehem Iron Co. use a mica  
schist found in the neighborhood for lining  
their Bessemer converters. Only the body of  
the vessel is lined with stone. The bottoms  
and nose are of fire-brick, and require con-  
stant renewal, while the body lining lasts  
three months, and will stand a campaign  
of 30,000 tons of steel.The Golden Age is the queen of the world's  
fleet of schooners. She has five masts,  
was built on the Huron River, in Ohio,  
measures 1763 tons, and carries 3300 tons.**Foreign Markets.**

FRANCE.

PARIS, July 1, 1886.—Metals.—Warmer weather  
has induced a good many business men to leave  
for watering places, and dealings in general have  
been quiet. The effect of this exodus, the metal trade  
in particular. Metals have been dull, with a drop in  
tin, some decline in copper, an advance in lead  
and lower prices for spelter. We quote toward  
the close of 100 kg. in francs: Copper, 102.50; Best Selected,  
102.50; Ingots and Slabs, 107.50; Best Selected,  
110.50; and Pure Corocoro Ore, 103.25. Tin, Banca,  
272.50; Billiton, 270; Straits, 265; Australian and  
English, 264.25. Lead, 39 @ 33.75; and Spelter,  
36.75 @ 37.25. Iron.—There has been no change  
in this city during the week. Merchant iron rang-  
ing between 13 and 13.25 francs per 100 kg. Adju-  
dications in connection with the Metropolitan Rail-  
road and the Exhibition buildings may soon be ex-  
pected. While iron is higher in France since  
spring, the contrary is the case in the Steel branch.  
Steel Rails having sold as low as 114.25 francs per  
ton delivered at Marseilles. This leaves 10 francs  
net at the works, and it is asserted that Rails can  
be sold at this figure at the mills and yet leave the  
makers whole. In the iron regions of France  
there is a moderate business doing at sustained  
rates, for as it believed prices will give way again,  
even should business flag a little during midsum-  
mer, a good fall trade being expected. Coal is  
quiet and firm.—*Moniteur des Interets Matériels.*

BELGIUM.

BRUSSELS, July 1, 1886.—Iron.—The demand for  
iron has been moderately active and steady; all  
works in Belgium are busy and have secured occu-  
pation for some time to come. There has come  
recently been no difficulty about maintaining syn-  
dicate prices, but no agreement has been reached  
yet as to a general reduction of output, interests  
being so wide apart that it is not an easy matter  
to obtain harmonious action under this head. As  
all our works seem to be making a living margin  
on their makes, and as overproduction does not  
threaten them for the present, the problem of re-  
ducing the output might as well be diminished and  
reserved for a time when circumstances recom-  
mend it more than they do at present. At any  
rate there is considerable difference of opinion  
among makers as to the proper basis for a re-  
duced production. Meanwhile we quote: Pig,  
Luxembourg Foundry, 1 francs per 100 kg.; Charle-  
roi, 6.75; Luxembourg Forge Pig, 3.80; Charleroi,  
3.70 @ 4.70; Merchant No. 1, 10 francs; No. 2, 10.75;  
No. 3, 11.50; Beams, 10; Angles, 11.50; Sheets, No.  
2, 12 @ 12.50; No. 3, 14.50; Commercial, 16.50; Thin,  
18.50; No. 4, 20.50. As matters stand we are bridg-  
ing over the dull summer time better than we  
have been able to do for some years past, due in a  
great measure to the tact and good understanding  
which characterize the action of dealers and pro-  
ducers in their mutual relations. Coal remains  
steady.—*Moniteur Industriel.*

GERMANY.

HAMBURG, July 1, 1886.—Iron.—The position of  
the iron trade is still an unfavorable one in Rhe-  
nish Westphalia, nor are there any signs of a speedy  
change in this respect. Domestic iron ore is still  
drooping, and Foreign neglected, Pig being dull  
and blast furnaces not buying beyond immediate  
requirements. The price of Pig iron is so low that  
it results in loss to the maker; hence several blast  
furnaces are to be blown out. The demand for  
Forge Pig, which was active early last month,  
abated toward the close of it, rolling mills again  
experiencing disappointments in the sale of their  
products. Foundry, Bessemer and Luxembourg  
are no better off, but Thomas and Spiegel form an  
exception and sell steadily. The trade in Finished  
iron is dragging, for although production has to  
some extent been curtailed it still exceeds the de-  
mand. Although building has been proceeding at  
a fair rate, strange to say Structural iron does not  
display the activity that had been looked for. For  
years past Thin Sheets have not been neglected as  
much as at present. Coarse sheets, on the other  
hand, are tolerably well sustained at 138 @ 140  
marks and over. As a general thing it may be  
stated that Finished iron is in a more precarious  
position than it was early in June. This may also  
be said of the steel branch, the demand for Rail-  
road material being evidently on the decline.  
Machine shops, foundries, bridge builders and  
boiler shops all complain. Metals.—Lead is look-  
ing up under a better demand.—*Borsenhalles.*

HOLLAND.

ROTTERDAM, June 27, 1886.—Tin.—The market has  
been excited and the price of Banca pushed to 63  
guilders per 50 kg., but it soon receded to 60, wind-  
ing up at 60 @ 61 guilders.—*Koch & Vleboom.*

SPAIN.

BILBAO, June 23, 1886.—Steel Rails.—The Altos  
Hornos Works, of this city, have turned out the first  
Spanish Steel Rails, pronounced unobjectionable by  
all the Spanish railroads after testing them.Export from Spain During the First Four Months  
1886.  
Tons. Tons. Tons.  
Calamine..... 11,742 15,533 10,001  
Pyrites..... 213,257 278,152 228,555  
Iron Ore..... 1,524,521 1,536,357 1,516,336  
Ingot Copper..... 5,745 8,402 8,125  
Quicksilver..... 1,028 499 465  
Pig Lead..... 42,491 42,138 37,578  
Total..... 1,798,784 1,682,371 1,706,060  
The decrease in Calamine and Lead will be noticed.  
—*Revista Minera.*

RUSSIA.

ST. PETERSBURG, June 28, 1886.—Iron.—The  
Belgian Cockerill Co. have been authorized  
by the Government to erect blast furnaces  
and rolling mills at Nizhny-Novgorod, on the Black  
Sea, and Krupp, of Essen, to build a large  
Gun foundry in the same locality. Mean-  
while the Prussian branch iron works in  
Poland find it difficult to get along. Rothschild  
is still buying Naptha refining works at Baku, in the  
Caucasus, after securing the Caspian Black Sea  
Co.—*Journal de St. Petersburg.*

AUSTRIA.

VIENNA, June 27, 1886.—Iron.—Business has been  
recovering slowly; in Pig there is a general ten-  
dency to cheaper production, so that the price has  
been reduced 10 florins per ton. While this is the  
case, Merchant Iron and Sheets have been placed  
at a slight improvement. We quote at the close:  
Pig, 48 @ 54 florins per ton; Merchant, 95 @ 12.50;  
Sheets, 140 @ 175, and Beams 100 @ 105, at Vienna.  
Metals.—have been moderately active and un-  
altered.—*Austrian Trade Journal.*

CHILE.

VALPARAISO, May 14, 1886.—Copper.—In spite of  
discouraging cable news the market has been  
swept by exporters in consequence of the decline  
in exchange, sales aggregating 17,300 quintals at  
\$18.30 @ \$18.60, the outside figure being equal to  
\$39.10. Nitrate.—At the luncheon meeting of the  
3d, producers resolved to continue the restriction  
of output to 10,000,000 quintals annually till  
March 31, 1887. This has not prevented a further  
heavy decline in Europe, where consumption  
seems to have suffered a serious decrease. All  
European orders have been withdrawn, nor is it  
likely that the demand will revive till prices on  
this coast shall have reached a much lower level,  
together with a further decline in exchange.  
Sales, 339,000 quintals at \$3.12 1/2 @ \$3.25 for 95 %;  
\$3.15 equals 7/10 in England. There were shipped  
so far in May 28,800 tons, and to the United States  
2570; loading 24,500 tons and 11,170 respectively  
charters, 13,500 and 6500. At the close 100,000  
quintals are still taken for the United States at  
\$3.25, 95 % and 1 1/4 % salt.

Shipments During the First Quarter.

	1884.	1885.	1886.
To the North of Europe.....	2,798,880	2,013,615	1,619,139
To the Mediterranean.....	137,966	20,582	57,298
To the United States, Atlantic Coast.....	569,170	536,308	422,487
To the Pacific Coast.....	29,633	41,685	82,113
Total.....	3,535,649	2,612,190	2,180,997

Coal.—Fresh Australian arrivals have depressed  
the market still further, the demand at the same  
time being light. We quote at the close Steam  
Newcastle, West Hartley, 10; Orrell, 17; Austral-  
ian Green Certificate, 8 @ \$7.25; other sorts,  
10; Smelting Coal, 15. Exchange.—The declining  
tendency provokes universal comment, and the  
Government is urged to do something toward  
restoring confidence. Last quotation, 21 1/2d.—  
Weber & Co.

AUSTRALIA.

SYDNEY, N. S. W., June 17, 1886.—Iron and  
Hardware.—A better feeling has continued to pre-  
vail during the fortnight without so far leading to  
any improvement in prices, but a rise is expected.  
We quote Galvanized Iron, No. 26, 27, and Fence  
Wire, No. 8, £2, 5/-;—Fer cable via London.

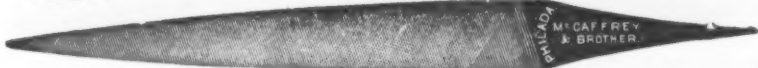


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The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world.

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For sale by the Hardware trade generally.

**CAUTION:**

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The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringements, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits have been already ordered.

All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives which are not of our genuine manufacture.

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EAST WILTON, MAY 10, 1886.

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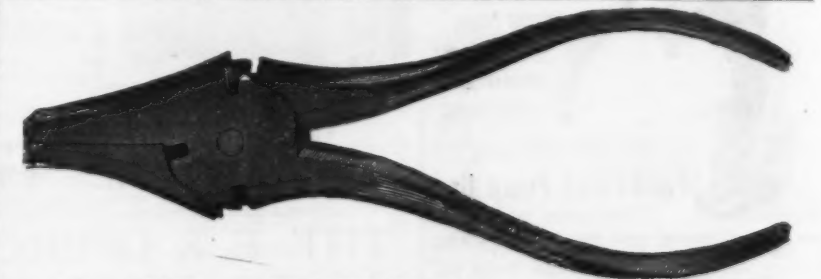
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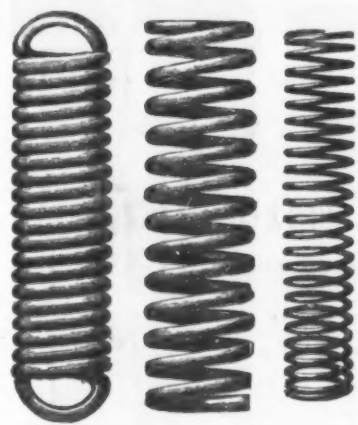
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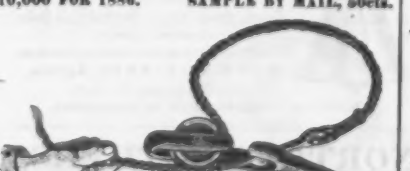
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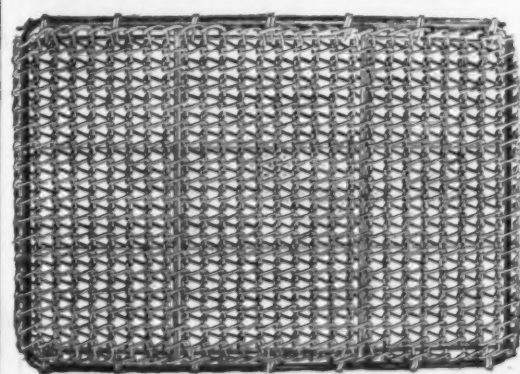
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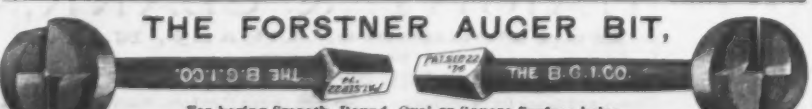
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New York Office, 17 Maiden Lane.

## The Plant of the Calumet and Hecla Copper Mining Co.

The following has been published from  
advance sheets of the report of Hon. C. D.  
Lawton, commissioner of mineral statistics  
of Michigan:

The Calumet and Hecla Co. have for some  
years been making extensive changes in their  
mining plant. These modifications include  
the substitution of heavier and more power-  
ful machinery in place of that which was  
formerly used. The changes have been  
going on during a period of six years and  
are now nearly completed. The numberless  
powerful engines, pumps, compressors and  
ponderous winding drums that one may see  
at this mine are indeed a sight worth be-  
holding. Nowhere else on this continent, if  
indeed in this world, is there so much power-  
ful and costly machinery employed in  
mining work. The machinery is duplicated  
throughout. The plan has been to open the  
mine several years in advance of actual  
stopping; and by the substitution of heavier  
machinery and its duplication to secure a  
larger output, and to insure against any con-  
tingency arising that should diminish this  
output. It has been done at the cost of an  
immense amount of money.

The undertaking of the Tamarack Co.  
was a valuable exploration for the Calumet  
and Hecla. It has strengthened the belief  
that this marvelously rich copper-bearing  
lode underlies all the great extent which the  
company here possess. It is a fact that  
this conglomerate deposit, without diminution  
in richness or in magnitude, continues  
throughout the Calumet and Hecla lands—a  
supposition for which there is every proba-  
bility—the wealth that the company hold is  
almost limitless. But the mining plant, the  
arrangements for operating the mine, al-  
though designed for meeting the wants for a  
long period to come, are apparently some-  
what cumbersome and costly (perhaps un-  
avoidably so), as the conditions were fixed  
early and the mine has so far outgrown all  
that could have been formerly anticipated  
regarding it. Possibly radical and expen-  
sive modifications will still be required.

No. 1 Calumet and No. 1 Hecla shafts are  
down to the 36th level. The other shafts  
are to the 34th and 35th levels, but there  
has not been a great deal of stopping done  
below the 24th level, and not much in the  
23d even. The levels are 60 feet apart per-  
pendicular; some of the upper ones are  
slightly less than that. The mine has a ver-  
tical depth of 2139 feet—maximum—or a  
depth measured on the plane of the vein of  
3390 feet. The maximum length, leaving  
out the Black Hills mine, is 5000 feet in  
round numbers. The latter is adjacent to  
the Osceola, south of the main mine. Only  
the sinking and drifting have been pursued;  
no stopping. It is claimed that the rock ob-  
tained from the openings has paid all the  
cost of the work. The Black Hill deposit is  
wider, but less rich, than the vein further  
north. There is considerable of the lode left  
in the mine in the shaft pillars and in the  
floors of the levels. A very large amount of  
timbers is used to stall up the hanging. The  
two main engines, one in the Hecla and one  
in the Calumet mine, are down to the 28th  
level, and will be soon completed to the 30th  
level. It takes about 20 minutes to go to  
the bottom, using the man engine. They  
seldom have an accident to any one on these  
machines.

The shafts are all single skip except No. 5,  
which is double, but only one is used. The  
skips are steel and hold 2 1/2 tons each. The  
skips travel in the Calumet shafts 1000 feet  
per minute, using the new engine Superior.  
They work about 1000 men underground all  
told, working two shifts. The total force in  
October was 2500 men, now in January it is  
2200 men, reckoned as so many days' work.  
They sum up the number of days' work done  
and divide by 25 to get the number of men.  
The total number of tons of rock mined and  
treated during the year was 535,820. The  
total product of ingot copper obtained was  
47,247,990 pounds. All of this was from the  
stamp rock except about 2 per cent., which  
was obtained from the "nigger heads" or  
small copper bowlders which are found in the  
conglomerate. Taking out the 2 per cent.  
we have 46,303,030 pounds as the yield of  
the stamp rock, we get 4.32 per cent. as the  
average yield of rock.

At the average price, at which copper was  
sold for during the year, this copper brought  
probably \$5,250,000. The company paid  
dividends to the amount of \$1,700,000,  
which leaves \$3,550,000 to be absorbed by  
the expenditures, assuming the reserve to  
remain as it had been. The cost of the  
copper was 7.4 cents per pound, which still  
leaves a margin for reduction, though prob-  
ably the cost is lower now than it has been  
in any previous year. There has been a  
pretty heavy construction account the past  
year, mainly at the stamp mill and in build-  
ing the railroad down to the dock at Lake  
Linden.

The following table shows the amount of  
rock mined and stamped each year for 11  
years, and the per cent. of yield:

Years.	Tons of rock stamped.	Yield per cent. ingot copper
1875.....	248,704	4.3
1876.....	259,935	4.37
1877.....	247,985	4.55
1878.....	271,000	4.68
1879.....	284,718	4.61
1880.....	284,248	4.75
1881.....	340,090	4.61
1882.....	349,128	4.59
1883.....	372,570	4.45
1884.....	425,255	4.68
1885.....	535,390	4.32

It is estimated that the company own  
80,000,000 feet of standing pine. A new  
hoisting engine has been put into the Hecla  
engine-house, 2500 horse-power; the former  
one has been taken to Lake Linden to du-  
plicate the pumping engine. They are also  
adding a powerful compressor to the plant  
in the Hecla Mine. This is to use in case of  
anything happening to the old one. At the  
stamp mill the railroad has been built down  
to the dock, giving a grade from the head  
of the incline to the lake of 190 feet to the  
mile. They are preparing to do away with  
the inclines, and hereafter the locomotives  
will haul the rock cars directly to the bins  
at the head of the stamps. It is a very sin-  
gular circumstance that the rock bins should  
have been set so low as to require the shov-  
eling of the rock under the stamps, instead  
of their being so placed that the rock could

be run under the stamp automatically, as is  
everywhere else the case. In the new  
arrangements this defect will be remedied.  
They have been changing the stamps,  
throwing out the Ball heads and putting in  
the Leavitt. There are seven heads in the  
Hecla mill and five in the Calumet. The  
mills are a short distance apart. Each head  
works about 225 tons in 24 hours, or the six  
running stamps in the Hecla mill stamp 1,400  
tons of rock per day and the Calumet mill  
stamps 800 tons. The rock is stamped down to  
the fineness of a 1/2-inch screen. The stamp  
shoes last five or six days; they are chilled  
iron, held in place by dovetail; do not differ  
from shoes used in other mills. Their  
weight is 675 pounds each. The stamps are  
fed with water through a 3 inch pipe run-  
ning under 15 pounds pressure. The force  
of the blow is 80 to 90 tons; mortar, 10  
tons; anvil, 15 tons; shaft, 3500 pounds;  
piston, 1500 pounds. It takes 6 1/2 tons of  
coal to each stamp per day.

There are four hydraulic separators, 52  
jiggers all told for each head, making 364 in  
the Hecla mill. This mill turns out 60 tons  
of copper per day; the other mill 35 tons.  
They work 12-hour shifts, 75 men and 70  
boys in the Hecla mill. Both mills have the  
same arrangements. The one is the dupli-  
cate of the other except in size. The slime  
is conducted through a discharge launder to  
a building where it is emptied into the bot-  
tom of a large wheel, 40 feet in diameter  
and 12 feet face. The water is taken up by  
the buckets on the inside of the wheel,  
which carry it up and empties it at the top  
into a launder that carries it cut on the  
trestle into the lake. A portion is drawn  
off to the slime mill. The wheel is clogged  
on the outside and slowly propelled by a  
pinion on a shaft, the shaft being moved  
by a 30-inch rubber belt. The motion of  
the wheel is 4 1/2 revolutions per minute. In  
the building is an engine 24 x 48, which at  
any minute may be connected to run the  
wheel in case of emergency; but the power  
that drives it is obtained by wire-rope  
transmission from the main engine-house.

The tailhouse is an experimental concern,  
where they work up a portion of the tailings  
obtained from the big wheel. They work up  
as much of this refuse as two small heads  
will stamp, and thus save about 30 tons per  
month of mineral yielding 35 per cent. of  
copper. The company use no slime tables,  
or vanners or similar machinery other than  
the jiggers to save the fine copper. The  
intention is to use slime tables in the future  
as soon as the arrangements are perfected.  
The tailhouse screens are 1/2-inch holes.

A new boiler-house, 85 x 210 feet, has just  
been completed of brick, with slate roof,  
which will hold all the boilers in the stamp  
mills—14 in all—6 feet in diameter each and  
30 feet long. All the machinery in the mill  
is run from the main engine-house by wire-  
rope transmission. In the same manner are  
run the incline, the slime discharge-wheels,  
tailhouse, &c. All possibility of stoppage is  
provided against by having duplicate engines  
to run every portion of the machinery at  
any moment. There are nine shafts for  
transmitting the power by wire ropes. The  
shafts are rubber lined; 3/4-inch wire rope  
is used. The shafts are 7 feet in diameter;  
the rubber lining is made of grooved sections,  
2 1/2 feet long. The two engines, each with  
power for the whole business, are named re-  
spectively the Erie and Wabec; the latter  
was doing the work when I visited the mill.  
The great pumping engine that raises  
all the water for both mills is the Ontario;  
its duplicate the Huron. The latter was  
lying idle. These four great engines in the  
one room are really an interesting sight.  
The mills are neat and orderly, and to stand  
in the Hecla building watching the ponder-  
ous stamps and the more quiet, but equally  
active, jiggers, one looks over a busy and  
pleasant scene. All the stamps in the Hecla  
mill have been changed, and the same is  
doing in the Calumet mill. This change  
effects a great increase in the output, as the  
new heads have a capacity of 225 tons daily,  
against 160 tons, the work of the old heads.  
The Hecla mill had originally only three  
heads, subsequently increased to four, but  
the building has been enlarged and three ad-  
ditional heads put in the past year, so that  
there are now seven. In the Calumet there  
are five.

The railroad extension is 2 miles; they  
are building a strong, heavy trestle to run  
the cars to the stamp mills. Smelting works  
will be built the coming year on the lake,  
about 1 mile from the stamp mills. The  
changes that have been made at the stamp  
mills in the past year are certainly great  
improvements and must result in much  
saving to the company. The Calumet and  
Hecla Co. have the reputation of pursu-  
ing a very liberal policy with their em-  
ployees. They pay them better wages, it is  
said, than any other company. The men  
are anxious to work for them and are loath  
to leave their employ. In some other  
respects the policy of the company and their  
methods are the subjects of much  
criticism. The Calumet and Hecla is a  
great mine now, and it is not likely to be of  
less magnitude for many years to come. It  
is scarcely possible that the future of a mine  
could be better assured than this is. The  
estate is so large, and all the developments  
go to establish the fact of the continuance  
of the lode under the whole of it, so that  
the only question in the remote future, it  
seems likely, will be how best to reach the  
copper. It is a curious fact that the stock  
which in April last (1885) was only at \$135  
had advanced in October to \$220. The  
total dividends paid to January 1, 1886, are  
\$28,550,000.

The following table gives the product of  
the Calumet and Hecla mine for each year:

Year.	T.	Lbs.	Year.	T.	Lbs.
1867.....	627	1,173	1877.....	11,394	1,498
1868.....	2,549	372	1878.....	12,625	1,185
1869.....	6,157	1,771	1879.....	13,135	943
1870.....	7,090	1,594	1880.....	15,837	1,239
1871.....	8,111	590	1881.....	15,687	781
1872.....	8,981	1,185	1882.....	16,085	1,258
1873.....	9,434	965	1883.....	16,583	1,045
1874.....	10,098	1,235	1884.....	30,235	1,505
1875.....	10,736	1,945	1885.....	48,628	1,900
1876.....	10,854	787			
Total.....				338,659	1,317

The Calumet and Hecla Co., contrary to  
the custom that prevails among the copper  
companies of Lake Superior, are not disposed  
to give any details of the cost of production,  
&c. Neither is the management willing to  
allow me to examine the map of the mine or



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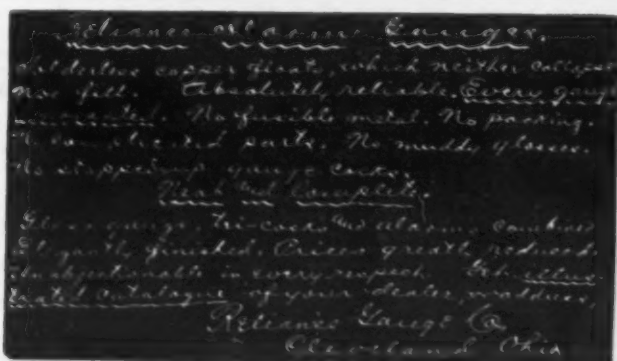
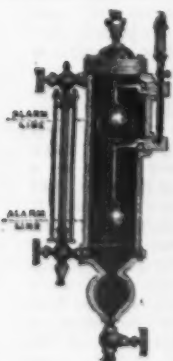
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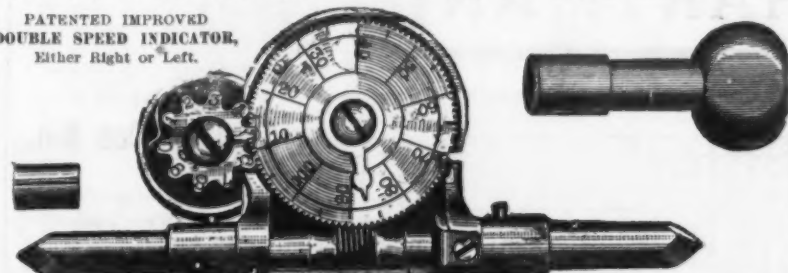
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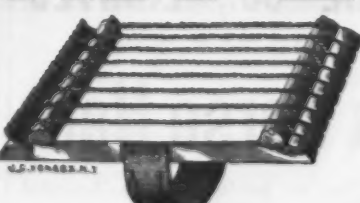
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MANUFACTURERS OF

ORNAMENTAL AND ART CASTINGS, ROSETTES AND PICKETS FOR WIRE WORKERS.  
Bases and Boots for Wire Forms, Pianos and Organ Castings, Machinery Castings,  
Stove Patterns taken from the Wood. Correspondence invited for all  
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Send for Wire Workers Catalogue.

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Wrenches.

PATENTED

May 9, 1871.

December 26, 1871.

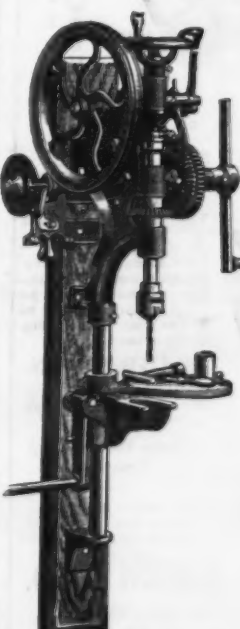
December 23, 1875.

August 1, 1876.

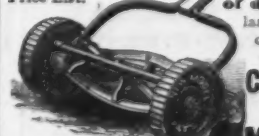
The back strain when the Wrench is used is borne  
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St., New York, carry a full line of our goods and will  
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Superior design. Durable Workmanship. Latest improvements.  
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The New ModelOur Latest & Best  
MOWER.For  
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quality of work  
it is unequalled,  
while for lightness  
of draft it excels, by a  
large percentage, any  
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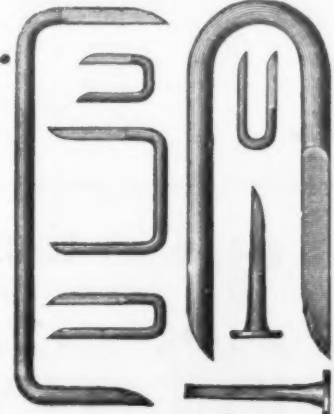


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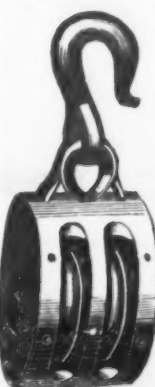
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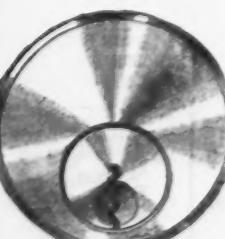
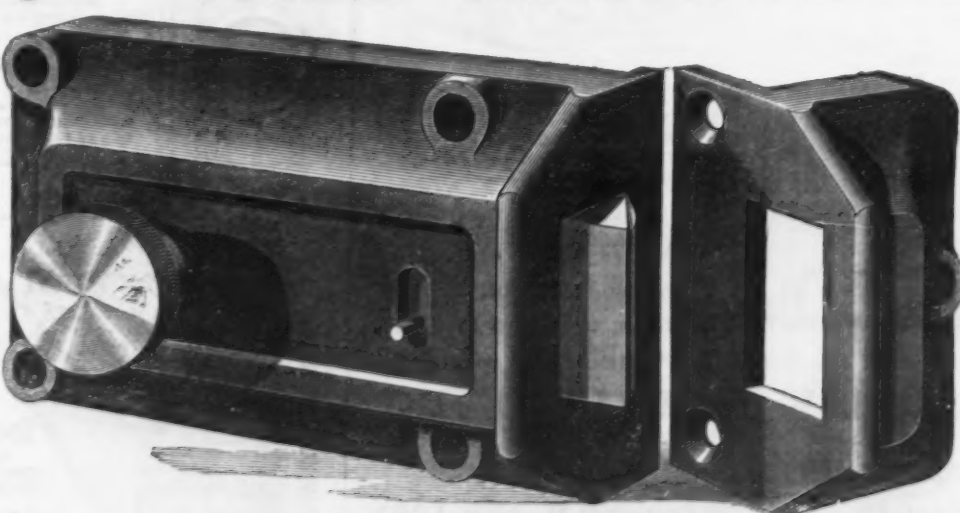
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to allow a copy of it to be printed in this report, a thing I very much desired to do. Such details as I have given were furnished me by the officers of the company or deduced from the information which I received, and there is very much more of a descriptive character that I might have added, but it has been said before in the main. The officers are: J. N. Wright, agent, Calumet, Mich.; Charles W. Seabury, secretary and treasurer, Boston, Mass.

## The Plans for the New Cruisers.

The board on additional vessels met at the Navy Department on Tuesday. That board took up for consideration the detailed plans of the proposed 4000-ton cruiser. Secretary Whitney has not been at all satisfied at the slow progress made, and the delay is attributed by persons in the department to the inability of the engineers to suggest any modification of the plans already in hand and brought from England. It is a subject of impatient remark that, at a time when Congress is to be called upon to appropriate money to build vessels, not a stroke of work upon the four previously authorized has been done. The plans to be taken up are for vessels of the type called "protected cruisers," having a water-tight protective steel deck extending throughout the length of the ship, covering the engines, boilers, magazines and steering gear, and strengthening the bow, the flat part to be about 1 1/2 inches in thickness at about the level of the outside water line, sloping at the sides to about 4 feet below the water, the sloping part to be about 2 1/2 inches thick. The proposed 4000-ton cruiser is about the same dimensions as the Naniwa Kan, recently completed by Armstrong & Co. for the Japanese Government. The drawings for this vessel were purchased from Sir William Armstrong & Co. by the Secretary of the Navy, and it has been stated that the Secretary would order one of the vessels authorized by the act of March 3, 1885, to be built from these drawings. At the Navy Department it is stated that, while the Secretary is desirous of building a vessel from the drawings of the Naniwa Kan, he has not fully decided to do so. If the Secretary of the Navy wishes to make a competitive trial of the merits of English and American designs he may order one of these large cruisers to be built from the English plans, and after the two vessels have been completed and run at their maximum speed for 1000 miles, or as long as their coal lasts, he can determine their relative value. The drawings have been examined by the representatives of various shipbuilding firms in the country, who commend the enterprise of the Secretary in securing the plans.

## The Making of Rubber Stamps.

The method adopted in turning out rubber stamps is thus described in the *American Lithographer and Printer*:  
The working of the desired rubber stamp having been correctly set up in ordinary type, the same is locked up and placed upon a level support. Around it is put an iron frame, which will determine the shape and size of the matrix. By means of a soft brush, the type as well as all surrounding parts that are to be covered by the plaster-of-paris are well oiled. For the purpose of making the cast, finely-ground fresh plaster-of-paris is needed; if of long standing the same will lose its desirable properties. This plaster-of-paris, of which a sufficient quantity should at one time be mixed to the consistency of pap, using clear water, is poured over the frame containing the type in a thin layer, so as to barely cover it. With a stout brush the mixture is driven into all spaces and interstices, until all details are thoroughly covered. After this the remaining pap of plaster-of-paris is added until the frame is filled to overflowing. The surface is smoothed down after the plaster has settled somewhat, and in a short while the matrix in the frame may be removed from the type. After this it becomes necessary to bake the matrix in an oven for a period of from four to six hours. When thoroughly baked the matrix should be well brushed with a thin solution of shellac to impart a smooth surface and at the same time greater strength. The matrix at this stage represents a yellowish-white block, in which the lettering appears indented, but in proper place. The indentation corresponds to the height of the letter upon the piece of type or the marks upon a cut, while the remaining parts should be perfectly smooth and free from holes. This matrix, obtained by a coating from the type or cut, will serve as the mold for the final rubber stamp.

Pieces of caoutchouc are cut to the required size and laid upon the matrix. If pressure is now exerted the soft mass will adjust itself to fill all the spaces and reproduce the mold invertedly. Indentations become raised matter, and the whole will show as did primarily the type. But as the caoutchouc has a tendency to return to its previous shape, it becomes necessary to apply the process called "vulcanizing." The object is to impart hardness to the rubber, and to prevent its losing the form into which it has been pressed. To accomplish this the caoutchouc must be heated to a temperature of from 120 to 130° C. As the substance is ordinarily softened by heat, it is necessary to take some means to prevent it from sticking to the mold. For the purpose soapstone will answer, and the mold as well as the pieces of caoutchouc should be well brushed or dusted with this substance. The duration of the heating varies with the thickness of the rubber sheets. As a general thing from 20 to 30 minutes ought to be sufficient. It may be mentioned here that special apparatus has been constructed for pressing and vulcanizing. The proper vulcanization is of the greatest importance in determining the durability of the stamp. All that remains to complete the stamps is the mounting of the rubber plate upon a suitable base or handle. This is best done either with zinc or with a solution of caoutchouc in benzene. The surface of the handle, as well as the back part of the stamps, having been covered with such a solution and well pressed together, after drying the entire stamp will be ready for use.

## Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending July 14, 1886:

Hardware.	Quantity.	Value.
Baker Hermann & Co.	50	\$51
Cutlery, cs., 9	509	42,566
Crandall & Godfrey,	22	11,129
Mach'y, case, 1	282	21,851
Drexel, Morgan & Co.	243	44,447
Arms, cs., 15	100,470	
Field Alfred & Co.	1,221	84,214
Cask, 1	116	5,798
Cases, 4	22	4,365
Folsom H. & D.	1,143	157,359
Arms, cs., 6	1,159	17,435
Gordon Otto,	25,522	296,595
Pkgs., 246	921	31,959
Godfrey Chas. J.	31,226	665,545
Arms, cs., 10	16,307	30,006
Mdse., cs., 7	921	31,959
Graef Cutlery Co.	22,813	465,489
Cases, 10	2,545	1,991
Hartley & Graham,	36,007	135,566
Arms, cs., 10	2,310	141,089
Lau J. H. & Co.	5,262	323,857
Arms, cs., 9	1,108	6,590
McCoy & Landers,	252	82,875
Case, 1	90	34,595
Mark & Co.	31	1,254
Cases, 2	1,620	12,000
Marshall & Co.	27	87,091
Mach'y, pkgs., 64	247	15,384
Merch. Disp. Co.	80	6,513
Arms, cs., 9	189	8,185
Moore's Sons, J. P.	4,190	48,061
Arms, cs., 10	1,199	58,278
Pim, Forwood & Co.	2,900	78,590
Mach'y, cs., 3	260	32,527
Sellers W. H.	1,128,708	1,197,124
Mdse., case, 1	506,734	18,722
Sheldon Geo. W. & Co.	12,510	
Cases, 7	695,145	2,774,329
Smith A. & Sons Carpet	8,543,875	1,405,295
Co.	7,250	87,107
Mach'y, cs., 25	97,298	8,369
The Barbour Bros. Co.	4,095	89,046
Mach'y, cs., 2		
The Hunter Sifter Co.		
Cases, 3		
Van der Toorn W. H.		
Arms, cs., 13		
Ward Asline,		
Mdse., cs., 2		
Ward Jas. E.		
Case, 1		
Witte John G. & Bro.		
Needles, case, 1		
Wieland & Hilger,		
Cases, 10		
Windmuller & Roelker,		
Gun barrels, cs., 2		
Order.		
Mach'y, pcs., 3		
Chains, cs., 2		
Iron.		
Baring Bros. & Co.		
Nail rods, bdls., 3994		
Nail rods, coils, 294		
Wire rods, coils, 745		
Bars, 118		
Brown Bros. & Co.		
Spiegel, lot, 1		
Rivet rods, coils, 512		
Coddington T. H. & Co.		
Sheets, bdls., 235		
Crocker Bros.		
Pig, tons, 1080		
Spiegel, tons, 337 1/2		
Redan M. Comacho.		
Basting, case, 1		
Foley E.		
Wire rope, coils, 12		
Greeley & Co.		
Wire, coils, 191		
Lillenberg N.		
Bars, 15,881		
Wire rods, coils, 29		
Lundberg Gust.		
Wire rods, coils, 653		
Moore's Sons, J. P.		
Wire rope, coils, 19		
Naylor & Co.		
Spiegel, tons, 30		
Pkgs., 250		
Bundles, 154		
Pim, Forwood & Co.		
Bundles, 50		
Perkins C. L.		
For iron angles,		
cs., 267		
Stetson, Geo. W.		
Pig, tons, 100		
Wood, Niebauer & Co.		
Bars, 496		
Order.		
Rods, bdls., 6119		
Pig, tons, 1079		

The imports of Cutlery, Hardware and Metals at this port for the second quarter of 1886 were as follows:

Quantity.	Value.
Antimony.....	50
Brass goods.....	509
Bismuth.....	22
Bronzes.....	282
Chain as anchors.....	243
Clocks.....	576
Copper.....	100,470
Copper ore.....	1,221
Cutlery.....	116
Dutch metal.....	22
Electrotype.....	1,143
Gas fixtures.....	1,159
Guns.....	25,522
Hardware.....	921
Iron, pig, tons.....	31,226
Iron, sheet, tons.....	16,307
Iron, spiegl, tons.....	921
Iron, tons.....	22,813
Iron, tubes.....	2,545
Iron, other, tons.....	36,007
Railroad bars.....	2,310
Lead, pigs.....	5,262
Machinery.....	1,108
Metal goods.....	252
Nails.....	90
Needles.....	31
Nickel.....	1,620
Old iron.....	27
Patina.....	247
Plated ware.....	80
Percussion caps.....	189
Pins.....	4,190
Plumbers.....	1,199
Regulus antimony.....	2,900
Quicksilver.....	260
Saddlery.....	1,128,708
Steel.....	506,734
Spelter, B.....	12,510
Type metal.....	695,145
Tin plates, bxs.....	8,543,875
Tin, slabs; 8,543,875 B.....	7,250
Wire.....	97,298
Zinc, B.....	4,095
Zinc oxide.....	

The following is a comparative statement of the quantity and value of metals imported at New York during the first quarter of the last three years:

1884.	1885.	1886.
Bar iron.....	521,351	229,711
Copper and ore.....	29,349	40,422
Pig iron.....	691,027	535,765
Iron, sheet.....	42,578	32,494
Lead.....	37,074	52,237
Spelter.....	81,748	29,445
Steel.....	905,350	585,033
Tin plates.....	754,570	808,596
Tin, slabs.....	2,418,525	2,351,292
Zinc.....	8,503	8,515

The C. W. Hunt Company have taken contracts for all the machinery necessary to fitting up a coal dock at Duluth, Ohio, which will cover 1000 x 300 feet, and will have a storage capacity of 150,000 tons of coal. There will be eight hoists or elevators, so that the unloading and storing capacity is put at 3500 tons daily. This immense affair is for the Lehigh Coal and Iron Company.



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PRICES LOW FOR QUALITY OF WORK FURNISHED

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COMPRESSED IRON AND STEEL SHAFING. IRON AND STEEL BOILER PLATE.

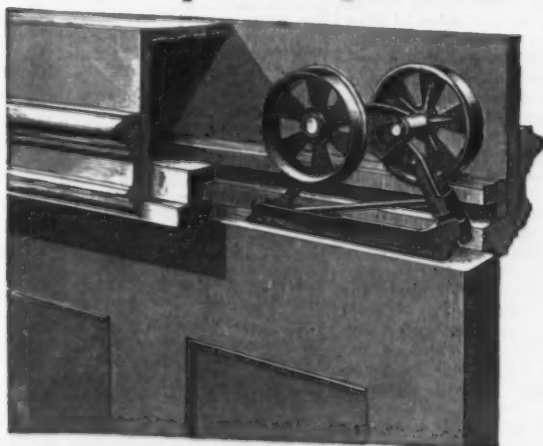
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Taunton, Mass., & 78 Chambers  
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### Barry's Patent Parlor Door Hanger.



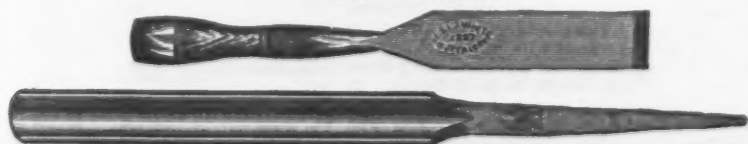
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Best Made.

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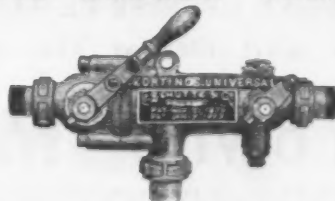
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Operated with

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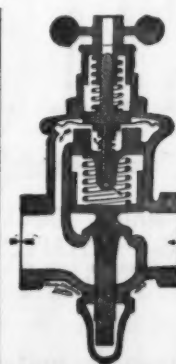
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Will lift either hot or cold water from highest suction, or will take supply from tanks above or street water pressure. Feeds Hot Water to Boiler. Uses no more Steam than any Steam Pump. Will Feed through Heaters.

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CURTIS  
Pressure Regulator,  
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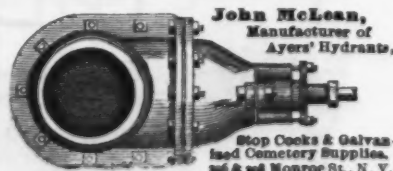
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OFFICIALLY PRONOUNCED SUPERIOR TO ALL OTHERS.

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2. Burning costs about ONE-HALF. Lighting power  
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## English Letter.

(From Our Regular Correspondent.)

LONDON, June 28, 1886

### THE GENERAL ELECTION

is in full swing, and is a disturbing element in all business transactions for the second time within 12 months. On all sides the din of electoral battle resounds, and feeling is running very high indeed. Instead of the old-fashioned square fight between the Liberals on the one hand and the Tories on the other, we have now Gladstonian Liberals alias Separationists, Liberal Unionists of the Chamberlain pattern, Whig Unionists of the Hartington or Goschen type, sane out and out Radicals prepared to go for anything, the Irish Nationalist followers of Mr. Parnell, Irish Orange Unionists and the Tories. This subdivision of the parties naturally yields a perfect babel of noise and hubbub, with so much keen recrimination among the various leaders that the rank and file scarcely know what they are doing or for what they are fighting. However, the hurly-burly will soon be over, and by the end of July we shall be once more happy (if in the possession of a Parliament). The odds seem to be in favor of the Unionists at the present time, inasmuch as arrangements have been made for the Tories to support all Liberal Unionists in places where there is no Tory candidate. In many places indeed the Tories have withdrawn their candidates, thereby giving solid proof, they contend, that they prefer country to party. Whatever the result may be, it seems certain that the next Parliament will have a short life. Your readers are not supposed to be deeply interested, I am aware, in British politics, but I mention these facts briefly in order to show what is very largely occupying the attention of the men of metal in this country. When the elections are over the holiday season will be upon us in all its perennial severity, and there will be a very general exodus to the seaside and the Continent. At the time of writing the weather is seasonably hot and summer-like, thereby favoring hay-making and other pastoral pursuits. The cereal crops look pretty well, and will come along rapidly should the present weather continue for another week or two. That, however, is doubtful, seeing that the inevitable "American storm" has been telegraphed, and is due with us two or three days hence. Your storm warnings are no doubt sent to us with the most benevolent intentions, but there are those who wish you would "leave our weather alone." I remember a year or two ago asking an old boatman on the beach at Yarmouth what he thought of the weather. He replied that he "didn't know nawthin' 'bout it." One time he used to be able to see a little ahead in respect of weather, but "since them Americans had managed things he couldn't make nawthin' of it." On this occasion we all hope that your predicted storm will not hit us, for we are now at a season of the year when fine weather is essential to the well-being of our crops and the proper ripening of our fruit.

There is really so little to remark upon in respect of the iron market that I shall content myself with referring readers to the report lower down on the leading features of the trade. In steel-rail and steel circles there is a good deal of curiosity as to the alleged big orders which are likely to be forthcoming for rails and sleepers. Nothing very definite is known at present, but it is alleged that the orders are in connection with some new schemes of railway extension in Western Australia and New Zealand. Several hundreds of miles of road are being made or are about to be made, and the report runs that nearly 100,000 tons of rails and considerably over 130,000 tons of steel sleepers will be wanted. For these handsome orders all the parties concerned—including the Germans—are on the lookout, and there will be an interesting fight for the contracts when the specifications are forthcoming.

SCOTCH PIG IRON is quiet, although there have been rumors of reducing the make, and other reports calculated (and perhaps intended) to influence an advance in prices. Furnaces at Monkland have been put out and put in again, while three of the Calder furnaces have been re-started after a breakdown, making the number now at work in Scotland 86, against 90 a year ago. In Connal's Glasgow stores there are 779,155 tons (an addition of 2941 tons last week), as compared with 600,558 tons this date last year. Shipments were rather better last week, but are 34,737 tons behind to date, while importations from Middlesboro' are 24,910 tons behind. Current prices are:

Deliverable alongside.	No. 1.	No. 2.
Gartsherrie, at Glasgow.....	43/	41/
Coltness, .....	47/	45/
Lanlochan, .....	45/6	41/6
Summerlee, .....	48/	41/
Calder, .....	46/6	41/
Carbros, .....	42/6	39/6
Clyde, .....	42/6	39/6
Monkland, .....	39/6	36/
Quarter, .....	39/6	35/6
Govan, at Broomielaw.....	39/6	36/
Shotts, at Leith.....	44/	43/
Carron, at Grangemouth.....	47/6	44/6
Kinnell, at Bonnyton.....	43/6	42/6
Glenrobert, at Ardrossan.....	43/	40/
Eglington, .....	39/6	38/6
Dalmellington, .....	40/6	38/

Speaking of Scotch pig reminds me that the will of the late Mr. Robert Donaldson, of James Watson & Co., the Nestor of the Scotch iron market, has been proven at £522,000 personality, besides a great deal of what we in this country term "real" property, such as houses, land, &c.

MIDDLESBORO' PIG IRON is reported to be a shade steadier for various rather occult reasons, but I do not gather that the real state of trade has undergone any improvement. Shipments, however, are a little better, and the make is said to be somewhat smaller. For G. M. B., f.o.b., at makers' wharves in the Tees, not cash, quotations are as under:

No. 1 Foundry.....	32/8	Mottled.....	28/
" 2 ".....	31/3	White.....	37/6
" 3 ".....	29/6	Refined metal.....	46/
" 4 ".....	29/	Kentledge.....	39/6
" 4 Forge.....	38/6	Cinder.....	30/

THE IRON MARKET

has hardly made the progress it was expected to make, judging by the conditions that existed 10 days or a fortnight ago. But while it has stopped somewhat short it has not fallen back, although several cir-

cumstances have transpired which, had the market been weaker, would no doubt have exerted a prejudicial influence. Contrary to anticipations, the Glasgow warrant market was characterized by a rather heavy fall at the end of last week, in the face of rumors widely circulated that some blast furnaces were to be damped down. These rumors were verified at the beginning of the current week by the damping down of four of the Monkland furnaces. But that damping down proved to be merely an expedient in a wages dispute, and on Thursday, the difficulty having been settled, the furnaces were again in blast. The furnaces at the Calder Iron Works, which have been out for a short time, owing to a breakdown of machinery, have also been relighted this week, the necessary repairs having been completed. During the week the warrant market has slowly recovered from its last week's drop, and closed at 33.6 1/2 p. ton. In Cleveland the tone was just a shade weaker at the opening of the week, but inquiries increased subsequently, and the business done has been on the whole more satisfactory. No. 3 is still quoted at 29/6, but transactions have been effected at slightly lower rates. On the West Coast the condition has been rather duller than was expected, but late rates still nominally prevail, while in Staffordshire no change is reported. The Swedish market shows no change, except that rates for India are rather weaker. Galvanized sheets, wire and manufactured iron also remain as before, but there is one cause for congratulation with regard to them, viz., that prices have not fallen, and makers are not anxious to sell far ahead at present values. Old scrap is also quoted below, but business is dull. By F. Pitts & Co., London: Old D. H. iron rails, 50/; No. 1 heavy wrought scrap, 40/ @ 42/6; old iron boiler tubes, 40/ @ 42/6; old leaf-spring steel, 47/6 @ 50/; cast iron, 37/6; flange rails, 47/6.

Freights for pig iron by ordinary steamer from Glasgow to New York remain steady at 5/ p. ton. Steel continues without change, unless it is that some of the works are a little better employed for the time being. Some further armor plates for H. M. S. the Aurora and the Immortality will have to be ordered by the Government, but what quantity is not yet specified. The demand for steel sleepers continues quiet, but extensive orders are under consideration and will shortly be placed. Steel rails are just now in feeble request, although there is a general feeling that prices have not only touched the bottom, but that future contracts will be based on more remunerative rates; nevertheless, £3. 12/6, or a shade better perhaps, is still nominally quoted. The only inquiry worth mentioning before the makers just now is one for 6000 tons for the Southern Mahratta Railway Co., and the one contract settled during the week, also worth recording, is the order of 1800 tons for the Oude and Rohilkund Railway, which has been placed with the West Cumberland Iron and Steel Co.

THE HARDWARE TRADES. The home trade in London cannot be said to have shown much life the last week or 10 days, and it is not anticipated there will be much improvement until we have fairly settled on the second half of the year. The export trade is still quiet, and without now and special feature in any of the more important markets. At Birmingham the first half of 1886 is ending as quietly as it commenced, so far as the hardware trades of the district are concerned, and manufacturers are straining their sight in vain for some symptoms of the long-promised "good time coming." It is strange that the American manufacture of machine-made watches should be so much more successful than kindred enterprise in this country, for the cost of labor and material is less on this side of the Atlantic. The rise in the value of tin is favorably influencing the pewter trade and other branches into which that metal enters, but the metal market on the whole is not buoyant or conducive to a revival of speculative movement. At Sheffield work has been resumed under somewhat languid conditions. Between the holidays and the electioneering activity country orders are conspicuous both by their absence and by their smallness. An exception to the general dullness is to be found in the agricultural-tool trade, which is now very busy with the dispatch of scythe orders. Second orders for scythes are coming in very freely, but the crops are reported to be light; hence the consumption of cutting tools is somewhat less, while, the grass being generally in good order for mowing purposes, more work is being done with the machinery and less with hand tools. The report of John Brown & Co., Limited, showing that the year's profits yield the same dividend as in the previous two years, viz., £5 p. share, or £6. 13/4 p. is more reassuring than there was reason to anticipate.

TIN PLATES. In London this market is decidedly stronger than it was at the time of my last report. There is a good inquiry for America and other markets, but makers generally are so well off for orders that new business cannot be placed except on the basis of 13/9 for good ordinary brands of IC cokes, f.o.b. Liverpool. At Liverpool the little spurt in tin plates last week did not improve prices much, but at any rate it put an end to all the talk about 13/3 IC for coke tins and Bessemer steel cokes, and every box that was offered at 13/6, IC was cleared off rapidly. The same price has been repeatedly offered for various lots since, and as resolutely refused. Quotations are now maintained quite firmly at 13/9 IC @ 14/ IC for cokes and Bessemer steels, and there have been numerous inquiries. Siemens steel plates with coke tinning have not shared so much in the improved demand of last week, and there are but few inquiries to hand, the higher quotations of 14/6 @ 14/9 IC not having led to much result, while the figure for business is still about 14/3 IC. There are a few more inquiries forterne plates, with a greater disposition shown to do business on the part of the buyers. Business in charcoal tins is extremely quiet, and there has been no upward movement in the prices of these. Coke tin plates, as well as Bessemer steel coke wasters, are in good demand at 12/3 @ 12/9.



# The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, July 15, 1886.

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### The Consumption of Bessemer Pig.

The heavy increase in the quantity of steel made for rails and for other purposes has affected a number of allied industries. The rush in the fall of 1885, creating as it did the fear of a scarcity of Bessemer pig, led to considerable importations; it produced a sudden activity in the demand for Lake ores, and brought out an increase in the imports of foreign ores. Since then considerable changes have taken place. Foreign Bessemer has been difficult of sale for months, except where special brands were wanted, chiefly for open-hearth purposes, its place being taken largely by American iron, made in many instances from foreign ores, which came in in considerable quantities, going as far West as Pittsburgh. As we have noted before, the duty on ore is only equivalent to about \$1.25 per ton on the iron contents of 60 cent. ore, while it is \$6.72 on pig iron. It is not surprising, therefore, that furnaces in the East can sell Bessemer pig for \$18 at furnace, located nearer to the steel works, while foreign metal costs, put into the yard of the Eastern mill, at least 75 cents to \$1 more. Under present circumstances whatever supplies are needed from foreign sources are likely to come in as ore, which is quoted about 10 cents per unit for Bessemer grades. The result is that quite a number of furnaces which ordinarily make foundry and forge irons in the East have turned to Bessemer, while in the West a similar movement has been going on with Lake and Pilot Knob ores as the basis. In addition to this nearly every furnace connected with Bessemer works has been running full blast.

This state of affairs has suggested to us the importance of an inquiry on the current output of Bessemer pig, with the object of showing that much of the increase in the product during the past six months has been due to the heavy demand for that grade, or, in other words, that it will not do to be

deceived by the published statistics into the belief that the make of foundry and forge grades is quite so heavy as it would be had not conditions changed. Such an inquiry is beset by considerable difficulties, and at best we can furnish only an estimate. During the past few years some grades of iron have found a market for the manufacture of steel which formerly did not classify as Bessemer metal. Then, latterly, too, the advent of the Clapp-Griffiths process has to a moderate extent diverted pig iron into this channel which would have ranked too high in phosphorus to be run into a converter. On the whole, however, we have reason to believe that thus far this quantity is relatively small. Thus far no estimate of the production of Bessemer pig has ever been made, and the only means of approximately ascertaining its consumption is to derive the latter from the known output annually of Bessemer ingots. This, of course, does not cover the whole, because a certain amount is used for open-hearth purposes. Comparatively speaking, however, this quantity is small. Another point which complicates this matter is that we have no means of getting at the quantity of Bessemer pig imported, it being lumped with the foundry iron and spiegeleisen. There is, furthermore, some difficulty in getting at a fair average figure for the amount of pig iron used in producing a given quantity of ingots. The waste in the converter may be placed at 12½ per cent., but on the other hand considerable quantities of scrap are used. In his census report, which unfortunately does not segregate Bessemer and open-hearth works, Mr. James M. Swank reports that in the manufacture of 985,208 net tons of Bessemer and 84,302 tons of open-hearth ingots—a total of 1,069,510 tons of ingots—there were used 966,603 tons of pig iron. In 1884 and 1885 the proportion of both classes of steel remained about the same, viz., 8.5 per cent. for the census year, 8.5 per cent. for 1884 and 8.8 per cent. for 1885. No great error will be committed, therefore, by assuming that the consumption of pig iron by both maintained about the same rate in the last two years. That is to say, the consumption of pig iron for making 1,540,595 net tons of Bessemer ingots and 131,617 tons of open-hearth ingots in 1884 was 1,520,000 net tons, or 1,268,000 gross tons, and in 1885 the quantity of Bessemer pig required for 1,701,762 net tons of Bessemer and 149,381 tons of open-hearth ingots was 1,673,000 net tons, or 1,494,000 gross tons. Only a small proportion of this was imported, say 43,000 tons in 1884 and 94,000 tons in 1885, leaving as the consumption of domestic Bessemer pig, roughly, 1,225,000 gross tons in 1884 and 1,400,000 gross tons in 1885. As only a very small quantity of charcoal pig is used in steel-making, we need have reference only to that produced with anthracite or bituminous coal or coke as a fuel. Deducting the output of spiegel in the years 1884 and 1885, we have 3,658,305 gross tons of these two kinds in 1884 and 3,656,566 tons in 1885. From this it appears that the Bessemer and open-hearth works in 1884 called for 33.4 per cent., or just about one-third of the product, and 38.3 per cent. in 1885.

### The Production of Bessemer Pig in the United States.

A statement of the current make, so far as we possess the data, will furnish important means of comparison with the consumption of Bessemer pig in past years. We may group the furnaces at work making Bessemer pig under two heads—those connected with the long-established steel-rail Bessemer plants and those of outside parties. Taking first the former, we have the Bethlehem with seven active stacks; the Pennsylvania, with five, and one leased in Maryland; the Cambria, with six; Lackawanna, five; Edgar Thomson, five; Cleveland, four; Union, four; North Chicago, four; Joliet, two, and Western Steel Co., two. This makes a total of 45 furnaces, whose joint product averages 120,274 gross tons per month, taking their actual output during the last quarter. Among the outside furnaces we may note, without being sure that it includes all, the Cedar Point, Cold Spring and Crown Point, in New York; Pequest and Secaucus, in New Jersey; Chester, Reading, Robeson and Durham, each one, and Crane five, in Eastern Pennsylvania; and in addition thereto a large proportion of the total make of the Cornwall furnaces in the Lower Susquehanna. In the Shenango Valley the Ella, Fannie, Mabel and Sharpeville are making Bessemer pig, and in the Pittsburgh district the two Lucy furnaces and one of the Schoenberger stacks. In West Virginia the Belmont, Riverside and Top Mill furnaces are producing the same grade, and in the Mahoning Valley, Ohio, the Briar Hill, Himrod and Thomas are making Bessemer iron. Among the other Ohio furnaces working on this grade are Mingo and Jefferson. In Missouri we have the Missouri furnaces. The average monthly make of these furnaces, were they all in blast at a time, would, on the basis of their production during the last quarter, be 71,057 gross tons. The Top Mill furnace and the Pequest are temporarily out of blast, and, generally speaking, slow working, accidents, going out for repairs, would probably reduce their monthly capacity to about 65,000 tons. In addition to this we must count that part of the make of the furnaces running on Cornwall ore, which monthly goes to Penn-

sylvania Bessemer mills, since careful roasting has removed the bugbear of high sulphur. We have no authentic data on this point, but from information gathered from producers of steel this amounts to certainly 15,000 tons a month, if it is not more, including the product of A. & H. Brock's Lebanon furnaces and J. & R. Meily's Lebanon Valley furnace. We have, then, a total make of Bessemer pig of at least 200,000 tons a month, while the total production of anthracite and bituminous furnaces is probably not far from 445,000 tons a month, thus showing that the Bessemer works use nearly 45 per cent. of the make. This figure proves that the progressive increase in the make of Bessemer pig has thus far continued in 1886, as compared with 1885 and 1884, when, as estimated above, it amounted to 38.3 and 33.4 per cent. respectively of the entire output.

It should be repeated that these figures cannot and do not make any pretense to absolute accuracy, the limitations to procuring exact data being too great. They are intended to convey an idea of the growth of this particular branch of the trade, which has its important bearings in more than one direction. With the rapid extension in the substitution of iron by steel, those furnaces which formerly made mill iron will be least influenced which are favorably located for a supply of pure ores. It means, too, a virtual increase in the capacity of many of them, because they substitute more easily reduced and richer stock for local supplies. Its most important influence, however, will be that it teaches both the producers and the consumers of foundry and forge grades that it would be unwise to assume that, because production has enormously increased during the last nine months, in a general way, therefore the output of the two kinds in question must also have proportionately grown. That is not so. The best grades of foundry iron are not plentiful even now, and as we have repeatedly insisted it will take only a moderate increase in the demand to make it actually scarce. During the first six months of the year we have imported large quantities of Bessemer pig, and the question may well be asked whether there is a prospect of the continuance of that movement. We believe that it may be answered in the negative, leaving out of account special low-phosphorus grades. If the rail mills continue as busy during the second half of the year as they were until July the call for Bessemer iron will become even greater, American furnaces having to do the work of smelting the quantity of foreign pig thus displaced. The outlook for the next quarter is assured, and only the winter months remain doubtful. On the other hand the resuming of a few of the Western rail mills will require more Bessemer stock.

There is another factor which will to some extent, in one way or another, aid the pig-iron industry. That is the question of old material. In the census year, according to Mr. Swank, there were used in the iron rolling mills, in producing 2,353,248 net tons of products, not less than 708,534 tons of old rails and 422,282 tons of scrap. We question whether 500,000 net tons are annually taken out of the tracks now, and the supply is constantly narrowing from year to year. That source of failing supply for material must be provided for from other quarters, and thus we will cease more and more to depend upon the legacy of a past generation, to expend our efforts toward obtaining it from the ore. The coming supply of old steel rails will not fill the gap.

A correspondent, whose letter appears in another column, offers some suggestions respecting our patent laws and the practice of the United States Patent Office, which are likely to excite discussion. The difficulty with examinations is becoming more serious every year, and there are a great many inventors who find that a disposition exists on the part of the examiners to throw out every application received, often on the most frivolous pretexts, and that the practice of the office is to devise as many obstacles to the granting of a patent as the examiner's ingenuity can suggest. On the other hand, thousands of patents are issued which are valueless, and which contain claims covered by other patents or fully described. The theory of examination is undoubtedly very good, but in practice it often works great and unnecessary vexation and expense, especially as it adds nothing to the value of a patent and does not help to sustain it when contested. The man who takes a patent into court finds that it has practically the legal status of an English patent, and its value depends vastly more upon a circuit court decision than upon the fact that it was granted after examination in the Patent Office. Examination is desirable and necessary, but those with large interests at stake very seldom depend upon the Patent Office for any knowledge of value. In a very large percentage of cases the references show that the examiner does not understand the nature of the invention described and claimed. Whether higher salaries would command the intelligence needed to make the examinations all that they are assumed to be, is doubtful. The Government could not afford to pay such men as much as they can earn in private practice. The question of reform in Patent Office practice is one of great moment to all who are interested in patents, and it might be discussed with advantage.

### Compressed Hot Air in Steam Engines.

That the intermixing of air with steam would prevent the condensation of the latter is by no means a recent discovery, and was practically applied more than a century ago in Savery's and also in Newcomen's atmospheric engines. Since then the general principles involved in aero-steam engines have been brought forward at different periods, and special prominence was given them some 15 years ago, when the system of pumping air into the boilers of non-condensing engines was tested at some length on the Lancashire and Yorkshire Railway, in England. Interest in the matter has again been awakened by the experiments made in the Brooklyn Navy-Yard about a year ago by a board composed of Chief Engineers Theodore Teller and George P. Hunt, of the United States Navy, with an apparatus submitted by Mr. E. M. Strange, for the purpose of ascertaining how much economic gain, if any, attended the use in a non-condensing steam engine of a mixture of saturated steam and of air compressed to the pressure of the steam and containing its heat of compression. A detailed account of these experiments is given by Chief Engineer Isherwood, of the United States Navy, in the June number of the *Journal of the Franklin Institute*.

The apparatus was attached to an old horizontal engine in the boiler shop of the engineering department. The cylinder measured 12 inches in diameter with a stroke of 30 inches. The air compressor, which was double-acting, was a plain cast-iron cylinder 9 inches in diameter, fitted tandem fashion to the steam cylinder, and therefore of the same stroke, 30 inches. This compressor was concentrically surrounded by a cylindrical reservoir of the same length, the space between the two measuring 1¼ inches and communicating with the air-discharge valves in the ends of the compressor. From this reservoir a 3-inch pipe carried the compressed air to the steam-pipe of the engine, entering between the throttle-valve and the valve-chest of the cylinder. A short branch from the air-pipe was fitted with a cock, enabling the discharge of the air from the compressor into the atmosphere if so desired. In the air-pipe also, and between the branch just mentioned and the steam-pipe, was a check-valve which prevented the steam in the steam-pipe from flowing into the atmosphere through the cock when the latter was open. When the engine was in operation the air was always being compressed in the compressor and discharged, whether the engine was used with combined steam and air or with steam alone. The experiments were four in number, constituting two pairs of comparable tests with different cylinder pressures, piston speeds and measures of expansion. There were two measures of expansion, cutting off at half-stroke and at seven-tenths stroke. During the experiments with the combined air and steam indicator diagrams were taken simultaneously every three minutes from both ends of the steam cylinder and from both ends of the air compressor. When the experiments were made with steam alone diagrams were not taken from the compressor, as repeated trials showed no sensible pressure in it when the cock in the branch pipe was open to the atmosphere. The results of the trials Mr. Isherwood presents in a long and interesting table—too long, we regret, for publication here. We take from it, however, the following figures, which supply a direct answer to the main question of economy in this particular case:

	Air and steam combined.	Steam alone.	Air and steam combined.	Steam alone.
Indicated horse-power developed by the steam cylinder.....	18,325.965	5,850.252	21,831.810	8,403.964
Total horse-power developed by the steam cylinder.....	34,271.512	17,020.610	35,502.781	22,836.655
Indicated horse-power expended upon the air in the air compressor.....	7,339.162	.....	13,335.262	.....
Indicated horse-power developed by the steam cylinder less the indicated horse-power expended upon the air in the air compressor.....	5,987.038	.....	8,496.518	.....
Total horse-power developed by the steam cylinder less the indicated horse-power expended upon the air in the air compressor.....	16,932.530	.....	22,167.419	.....
Number of pounds of feed-water consumed per hour per indicated horse-power developed by the steam cylinder less the indicated horse-power expended upon the air in the air compressor.....	129.60003	133.05163	105.73900	104.897251
Number of pounds of feed-water consumed per hour per total horse-power developed by the steam cylinder less the indicated horse-power expended upon the air in the air compressor.....	45.8307705	45.985774	40.549542	39.708378

The total horse-power represents the entire work done by the steam, including the indicated horse-power and the power required to overcome the back pressure. It is therefore the proper unit whose cost in heat, represented by the weight of feed-water consumed per hour, is to be used as the correct economic result for comparison in cases like that of the trials in question. The figures which we have given show that there was neither gain nor loss in economy of fuel due to the use of combined air and steam as compared with the use of steam alone. This is explained by the conditions of the experiments, which, according to Mr. Isherwood, were not and could not be made such as to show whether any economy of steam could be effected by the use of intimately mixed air and steam. The mixing by which alone any economic gain could be accomplished was entirely wanting. This will be readily understood when it is considered that the air compressor delivered its compressed air into the valve-chest against the valve-chest pressure without interruption, and that only after the mass of air was withdrawn by the steam cylinder from the valve-chest could steam enter the latter

from the boiler, and also that the time during which any single charge of air and steam remained in the valve-chest was extremely limited—0.6 second in one experiment and 0.5 second in another. The same conditions further existed for the cylinder in these respects as for the valve-chest, and there was consequently just as little chance for mixture there.

It is interesting to note in connection with this what Mr. Isherwood says of the "Cloud engine," which was brought out some 30 or 40 years ago. This was a non-condensing steam engine operated by a mixture of air and steam. An air pump or compressor delivered the air into the steam space of the boiler, depending upon the conditions existing there to effect the proper mixing. An experiment was made with this system on a small steam cylinder at the Novelty Iron Works, in New York, the power in the two cases of using first the mixture and then the steam alone being measured by a friction brake. While no very definite particulars of this trial are at hand, it is understood to have shown a large economy in favor of the mixture. Under the circumstances it is greatly to be regretted that Messrs. Zeller and Hunt were restricted in their work by a decision of the Navy Department not to allow the slightest expenditure of money for experimental purposes in steam engineering, and could therefore not repeat this experiment. The results would undoubtedly have been such as to arouse widespread interest. The cost of the trials which Messrs. Zeller and Hunt did make was defrayed by Mr. Strange, the designer of the apparatus. Why economy should be expected from the use of a mixture of steam and air will be understood from the results of experiments made by Prof. Osborne Reynolds in 1873. These favored the conclusions, among others, that a small quantity of air in steam greatly retards condensation upon a cold surface; that the rate of condensation diminishes rapidly and nearly uniformly as the presence of air increases from 2 to 10 per cent. of the steam, and then less and less rapidly until 30 per cent. is reached, after which the rate of condensation remains nearly constant, and that by mixing air with the steam before it is used the efficiency of the engine is increased. The maximum effect, or nearly so, according to Professor Reynolds, will be obtained when the pressure of the air is one-tenth that of the steam, or when about 2 cubic feet of air at atmospheric pressure and a temperature of 60° F. are mixed with each pound of steam.

The most potent cause of the lessened condensation of steam when mixed with air is the separation of the molecules of the former by the molecules of the latter. Evidently there can be no condensation unless the steam molecules can combine. Furthermore, the steam when thus mixed with air is superheated, or, in other words, has a temperature higher than is normal to its pressure as saturated steam; and as that excess of temperature must be removed before liquefaction can set in, the rate of condensation must naturally be diminished. Bearing all this in mind, engineers will heartily agree with Mr. Isherwood's remark that the subject is of sufficient importance and promise to warrant an exhaustive experimental investigation. A good foundation for this work has already been laid, and the results would form valuable contributions to the present knowledge of steam engineering.

Since the profit and loss account of the copper-producing concerns in Germany has become very discouraging under the pres-

	Imports.	Exports.	Present duty.
	Met. tons.	Met. tons.	per 100 kg.
Copper, ingots.....	18,168.4	576.9	Free.
Cop'r coins, scrap, &c.....	350.6	861.7	Free.
Bram. yel'w met'l	741.4	408.2	Free.
Copper rolled or forged.....	188.8	3177.7	12
Copper wire.....	168.7	667.8	12
Telegraph cable.....	41.9	301.1	12
Plated copper, sheets and p'ls.	8.0	112.0	28
Plated cop'r wire	3.9	321.6	38
Cop'r wire cloth	8.5	177.8	18
Coarse copper forgings and brass castings.....	554.1	1772.8	18
Cart'g'es and caps	49.8	923.4	33
Other manuf's of cop'r, brass, &c	499.7	2796.0	30

ure of the competition of this country, Spain and Chili, there has been considerable agitation for a duty on ingot, which till now has entered free. One of the newspapers which opposes this change in behalf of manufacturers of copper quotes the following official import and export returns for the year 1885:



which is now to be decided by a laborious official inquiry is to what extent a duty on ingot would hurt the manufacturers, who depend largely upon a foreign trade, without being able to reach supplies of imported stock cheaply under drawback arrangements. The American copper trade has considerable interest in this matter, because quite large quantities of American furnace material and ingots went to Germany directly and indirectly last year.

#### The Duty on Tin Plates.

In explanation of the provision of his revenue and tariff bill increasing the rate of duty on tin plates from 1 cent to 2½ cents per pound Mr. Randall makes the following observations:

The present rate of 1 cent per pound on tin plates is purely a revenue duty, and operates as a tax upon the consumer, without benefiting any American industry. If we cannot produce the article in this country, then this tax should be taken off. If by increasing the rate 1½ cents per pound we can establish the tin-plate industry successfully in the United States, it is certainly wise policy for us to do so. It would result in giving needed employment to labor and capital, would by competition give the consumers of the country a better article at a price no greater than is now paid for the inferior article we get from abroad, and the use of which has proved so detrimental to our trade in canned meats, fruits, &c., and would relieve us from dependence upon a foreign country for an article of such extensive and indispensable use. It is claimed and believed that with a duty of 2½ cents a pound the tin-plate industry would be speedily and successfully established. In this view let us try the experiment, and, if it fail, then remove the duty entirely. The United States is the largest consumers of tin plates in the world. We afford Great Britain a market for two-thirds of her entire production of that article. In fact, we have practically built up and are sustaining the most prosperous branch of the iron and steel industries of England and Wales, and this, too, largely to the detriment of our domestic manufacturers of these qualities of sheet iron and steel which enter into competition with tin plates andterne plates for certain important uses. Our mines contain all the raw materials entering into the production of tin plates andterne plates that are to be found in the mines of England and Wales. Yet we do not produce a box of these plates, for the reason that the duty imposed does not adequately protect our higher-priced labor. Within the past six years we have paid British manufacturers over \$100,000,000 for tin plates, besides paying foreign vessels some millions more for bringing them to our shores. This is too much money to send out of the country for an article we are capable of producing, especially when the balance of trade is running against us.

Mr. Randall's argument is logical and consistent with the facts of the case. Whether it will commend itself to approval or not depends upon whether it is deemed advisable to develop a new American industry. There are arguments for and against such a course which are entitled to intelligent consideration. On the one hand it is insisted that, as tin plates are articles of universal consumption in the countless shapes into which they are manufactured, the interests of consumers demand that they remain as cheap as possible, and that the present revenue tax of 1 cent per pound should be removed, as the revenue resulting from it can be very well dispensed with. Those who hold this view insist that we have in this country none of the experience and but few of the facilities demanded for the economical manufacture of tin plates; that those who are so eager to go into the business have no knowledge of its requirements and could not make good plates; that labor and materials are all higher in this country than in Wales, and that to protect an industry yet unborn for the sake of creating it, would be to carry the principle of protection a great deal further than public opinion would have sustained even during the years when the development and diversification of industry was sought by such means. They further insist that, while a duty of 2½ cents per pound would undoubtedly encourage the experimental manufacture of tin plates in this country, it would by that much increase the cost to the consumer, as the margins of profit to British makers are so narrow that there is no room for further reductions in the cost of imported plates, and American makers would undoubtedly demand whatever advantage the tariff might give them.

The argument on the other side is substantially this: Large sums are annually paid to British makers for tin andterne plates which might as well be made in this country, consuming domestic materials and employing American labor. The industry is one presenting no technical difficulties, and all that American makers do not know are the tricks by which plates of inferior quality are made to appear as if well coated. We have better iron than is made in England, and all the facilities for rolling it which are required. Tin is as cheap here as in London, and sometimes cheaper. The competition of American manufacturers would give us tin plates of better quality than the average of those imported, and consumers would be able in every case to get what they pay for or know where the responsibility lay. An immense business would thus be created, and the competition of domestic makers would in time reduce the prices below those which good grades now command. It is further claimed that the importation of tin plates under a revenue duty makes an absurdity the 1½-cent rate of duty charged on common black iron, since it permits the manufactured product to come in at a lower rate than the material of which it is made. This discrimination also permits imported tin plates to compete injuriously with the sheet iron manufactured in this country, and retards the development of an industry which is of great consequence.

The advocates of a protective duty further insist that the present rate on tin plates is due either to a clerical error in, or an accidental misinterpretation of, the law; that it is inconsistent with the spirit of our economic legislation, and that the development of a tin-plate industry in the United States proportionate to the consumptive requirements of the country would add enormously to our national wealth and have a marked effect upon our international trade balance.

It is impossible to reconcile arguments so widely apart as these. Congress has refused year after year to change the tin-plate duty, even during the period when high protective legislation commanded the strongest support. The present temper of Congress is certainly not favorable to such a change, and it is doubtful if any amount of discussion will induce a favorable consideration of Mr. Randall's measure, at least so far as the tin-plate duty is concerned. Those to whom this is a subject for regret will have to count tin-plate manufacture as among the things for which opportunity was never offered. Mr. Randall might have advocated the 2½-cent duty to some purpose ten years ago, and had he done so Pennsylvania would now be producing a very large part of the tin plates consumed in the United States, and the country would be richer by many hundreds of millions of dollars.

The steel-rail trade continues to enjoy the exceptional prosperity which has characterized it for the last half-year. The sales reported to the Board of Control were 670,600 gross tons on the 1st of January. They rose to 729,500 tons on the 1st of February, reached 869,000 tons on the 1st of April, aggregated 950,805 tons on the 1st of May, and in the beginning of this month rose above 1,000,000 tons—or, to give the exact figures, 1,080,143 gross tons. The allotment, which was only 775,000 tons at the organization of Long Branch about a year ago, was increased from time to time under the pressure of a growing demand, until it was decided a few days since to carry it up to 1,400,000 gross tons. A good deal of the business done previous to the opening of the year was during the rise, so that the higher quotations current for many months are considerably better than those which the mills will average. In fact, we know of cases of works rolling in 1886 rails contracted for at as low a figure as \$27. It will not do, therefore, to assume that the sums realized by the mills are so high as seems to be generally believed. In a month from now, on the 12th of August, the annual meeting of the Rail Association is to be held at Long Branch. The success of their first year in securing to the works all the benefits, due after all to a much greater demand, will probably lead to their continuance, with possibly some modifications of detail. There are those inimical to this great industry who would make it appear that it was the combination of the makers alone which enabled them to secure remunerative prices. The fact is that what strength the market has had for months has been due to well-filled order-books, caused by heavy requirements for renewals and for new mileage. Our mills have been taxed to full capacity thus far; they are most of them unable to deliver on new orders up to October, and will probably then have work enough to carry them to the end of the year.

#### The American Patent System.

To the Editor of The Iron Age: Some foreign economists have recently made violent attacks upon the policy of patent laws. These attacks are not directed so much against any particular defects acknowledged or asserted to exist in any particular law, but against the principle of the law itself. They advocate the abolition of all patent laws and the extinction of the system on the ground that it interferes with the freedom of industry. So far indeed has this movement gone that bills are introduced in the British Parliament at each succeeding session having this object in view. The "Abolitionists" in Parliament, and there are not a few of them, under the leadership of Sir Roundell Palmer, announce their purpose of ultimately breaking down the law. Committees from both Houses have time and time again inquired into the subject, and, although they have uniformly reported in favor of the continuance of the system, the fact that such an investigation was deemed necessary at all shows that the objections are considered as having some weight and force. Lord Kenyon, one of the ablest of English judges, said in a celebrated patent case: "I am not one of those who greatly favor patents." Holland abolished her patent system in 1870, and Bismarck, who was secretary of the North German Confederation, in 1868, strongly urged upon the Parliament a similar policy. Switzerland never had a patent system, and, notwithstanding strenuous efforts in favor of such a law, the Legislature of that country refused to enact and sanction it. In France also there has been much opposition to the system, and as late as 1878 M. Chevalier denounced all patent laws as unnecessary and positively injurious. Even in the United States there will be found many who take the same view, though they are seldom so radical as the European writers.

The abuses connected with the introduction of certain patented specialties in the West created much dissatisfaction among the settlers and farmers of that region. They went so far as to demand the repeal of our law, and the question was even broached at Washington. All these undoubted facts show that there must be some real or fancied evils arising out of the present system of securing to inventors the ex-

clusive right to manufacture and vend their inventions. And all these inventions may be summed up under the head of the oppression of industry and the stifling of competition. The theory is that it permits one man to build up a monopoly, and make such exactions as he pleases of the general public, thus injuring both the consumers and other producers or manufacturers. They also take the ground that there can be no property in ideas—that ideas are free and belong to every one; no one should be allowed to appropriate them to himself for his own exclusive use and advantage. It is claimed, in addition to this, that no benefit accrues to the people from the system, because as soon as any necessity is felt for any particular improvement it will be invented without the artificial stimulus of the patent laws.

In the United States, however, if nowhere else, the advantages of our policy in this respect are too apparent for these objections to have much weight. The vast majority of the people warmly support it, and, in fact, it has become so firmly established that few men dream of questioning either its legitimacy or expediency. The system has been productive of most marvelous results. The genius of American inventors, stimulated by this protection, has developed and even created new fields of industry, the effect of which on civilization is simply incalculable. This would not have been so without our patent law holding out its reward for the inventor's labor and patience. Nearly 300,000 patents have been granted in this country. It is said that there are 5000 or 6000 professional inventors, whose sole occupation it is to invent, and who are entirely dependent upon the protection of the law for their existence. The amount of valuable work wrought out by these men cannot be overestimated. Sir Henry Bessemer said before a committee of the House of Commons that his experience during the time he was experimenting proved to him clearly that, if "I had had no patent law to fall back upon, I as an engineer could never have first spent 2½ years of my time and \$4000 in experiments, which, if they had failed, would have been an entire loss to me. Altogether I made an outlay of about \$20,000, but, of course, I had a large stake to play for. I knew that steel was selling at \$50 to \$60 per ton, and I knew that if it could be made by my plan it could with profit be sold at \$20 per ton. But if it had not been for the law securing my right in my invention by a patent I could never have hoped as a simple manufacturer to recoup myself."

Another great advantage of a patent system is that it facilitates, and in many cases is the only thing which makes possible, the introduction of valuable inventions. A large amount of money is often necessary not only to experiment, but to carry on the manufacture after the idea has been perfected. No capitalist would be willing to take the risk if he knew that any one could take advantage of his expenditure as soon as it was seen that the venture was successful. Even with the patent law in force others will endeavor to infringe, and it is well known that there is no really valuable patent which is not driven to the courts for protection at some period of its existence. Remove the protection now afforded and the public will be deprived of the great benefits of many highly useful inventions. Not only is the stimulus to invention taken away, but also the inducement to investment. The amount saved to the country by labor-saving machines annually is something enormous. The steam-power of Great Britain is said to be equivalent to the labor of 400,000,000 men. It is estimated that the McCormick reapers effect a saving of \$10,000,000 a year in the United States alone. The experiments and improvements in connection with this machine cost the McCormick company an outlay of \$1,000,000, an amount which would never have been ventured except with the expectation of the ultimate monopoly of manufacture, to which both in reason as well as in law they were entitled. But the patent system in this country is too strongly established to fear any radical change. Even in a country like Switzerland, where there is no such law, the advantages to be derived from it are beginning to be seen. One of the Swiss commissioners to the Philadelphia Exposition strongly urged its adoption on his return. What he had seen of the productions of American invention surprised him, in comparison with the work of his own countrymen, and yet, as he says himself, the Swiss are reputed as ingenious as any other people.

That there are abuses and defects in the law, its administration and practical workings even in America cannot be denied. But, nevertheless, our system is justly regarded as the most highly developed and perfected system of all those in operation. Its distinguishing feature is the preliminary examination to which every invention is subjected before the letters are issued. The amount of labor and the degree of knowledge and skill which this requires is undoubtedly great, but the advantages derived from it are readily apparent. In England and other European countries letters are granted almost as a matter of course. There may be 20 or 100 patents covering the same ground, and no one can say to whom the patent rightfully belongs until the question has been litigated between all these various patents. The same difficulty exists here to some extent, but after the examination has been made there is at least a *prima facie* right to the patent on the part of the inventor to whom the letters are granted. The difference between the English and the American systems in this respect is immeasurable. A great many applications are entirely rejected, and others are rejected in part, so as to require modification by amendment. In fact, the Patent Office is becoming more and more strict every year. Very few applications go through the first time without either a rejection or a reference. The claims almost always require some change in order that there shall be no conflicting patents even in detail. The office in this way accomplishes much of what in England is thrown upon the courts. Admirable as this system is, it still has some defects. The salaries paid the examiners are not sufficient to secure the services of really eminent experts in the various branches. The

position of examiner is regarded even by themselves merely as a training school for patent solicitors, patent lawyers, &c., and the office is thus deprived of the services of invaluable men just at the time when they are becoming indispensable. The surplus revenue, which increases in amount every year, could not be employed in a better way. The examiners are often called upon to decide the most difficult questions of law and fact. They should therefore be both trained lawyers and experts. One suggestion is urged looking toward the reform of the system, and that is the establishment of a higher standard of invention in order to merit a patent. This would cut off a great many comparatively useless inventions, if inventions they can be called, would lighten the labors of the office and would go far to counteract the evils objected to on the ground of interference with industry. Then, again, the practice of widening claims by reissue far beyond the original claim has been a great evil, for the reason that it had the tendency to deprive other inventors of the fruit of their labor, for reissues, as is well known, frequently were obtained for no other purpose save the absorption of later improvements. This practice was emphatically condemned in Miller against the Brass Company, in 1882, but the subsequent decision by the same bench in the case of Mahu vs. Harwood, following up the same principle, has been vigorously denounced both by lawyers and inventors as contrary to law and the true interests of inventors. The injustice done to inventors by the rule there adopted, to hold reissues void in many cases on the ground of delay, was pointed out at the time in these columns.

One reform which has been suggested is an annual tax on every patent, increasing in amount every year. It is urged that such a tax will have the effect of weeding out useless and unsuccessful inventions and will also yield a handsome revenue. The inventions which are successful will of course be easily able to pay the tax. If this tax will have the effect of reducing the amount of fees as they are at present it might prove advantageous. The revenue of the Patent Office far exceeds its expenditure, and there is no reason why inventors should be specially taxed for the support of other departments of the Government. The preliminary fees often weigh heavily upon inventors, and they are better able to pay the tax after their inventions are in operation than the fees at the time of application for the patent. Of course there should be some fee in order that the office should not be overwhelmed with worthless applications, but they could without harm be much less than they are at present. COUNSELLOR.

#### WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., July 13, 1886.

The tariff question in the House is regarded by disinterested observers as getting somewhat mixed. Mr. Morrison started out on a huge attempt to reduce "tariff taxes" by wholesale, but under the pressure of public sentiment hauled in his horns very materially in a modified bill which the Republicans and 35 of his own party sat down upon. Mr. Randall introduced a bill to reduce, equalize and modify, in order to be consistent. The Committee on Ways and Means, in order to be consistent, have reported it back adversely, with a report mainly directed at Randall. That gentleman proposes to be consistent, too, and will reply to the screed of the majority of the committee. The report of Mr. Morrison is recognized as a somewhat remarkable document. By the committee it is considered more the personal views of the gentleman from Illinois than of his colleagues. The report as printed is not signed, as is usually the case by the gentleman approving it. The report claims that the reductions proposed by the bill will aggregate \$48,000,000 on last year's receipts from internal revenue and customs, and according to Randall the amount will be \$36,000,000. When Morrison introduced his free-trade bill the revenues were redundant and taxes were excessive and should be reduced, so he said in his report. Now he says that there are no excessive revenues to be reduced. He even charges that the enactment of the bill into a law will leave the Government \$48,000,000 short of the sum necessary to its administration and the requirements of the public debt and pensions. This he calls lacking in patriotism, forgetful of public faith, result of fiscal distemper, and hindering a just comprehension and intelligent treatment of the subject.

#### WHAT MORRISON THINKS THE BILL DOES.

Mr. Morrison strikes an analytical term by saying that the bill changes the duty on articles yielding less than one-tenth the total revenue of \$181,000,000 from customs, and increases those which yielded \$11,600,000 and decreases those which yield \$5,000,000. On this form of reasoning he charges that Randall does not reduce the revenue from customs \$8,570,000 at all, but increases it \$5,500,000. A little before he argued that the Government would be short \$48,000,000, of which some \$8,000,000 was for customs. He then proceeds to dissect the bill by items, and in doing so makes no allowance for the protection of American labor, and only multiplies the evident confusion of his own ideas on the subject. He launches out into a charge that the bill was framed on the idea that a reduction of revenues and not of taxes was the aim, which idea, he charges, is an arbitrary assumption and "entitled to no respect whatever." It has not been discovered that the divers Morrison bills were designed for any other purpose than reduction of surplus revenues. The so-called "reduction of taxes" at the expense of home industry required to manufacture the articles which he proposes to flood the country with from foreign sources was simply a subterfuge.

#### COTTON TIES AND TIN PLATE.

On the subject of cotton ties and tin plate the report is particularly weak. It says: "Cotton ties, which are a considerable item of expense, and indispensable to the sale of cotton abroad, when taken in exchange for cotton or otherwise, may be imported for \$35 on the \$100 worth. This \$35 is to be in-

creased to \$69.30. Tin plate, an article essential in every home, and especially so among those who work in shops, mills and mines, and are large consumers of canned food, is now taxed 1 cent per pound, and yields \$5,055,590 to the Treasury. This is to be increased 125 per cent., or to 2¼ cents per pound, amounting to \$11,375,070, but the increased tax is estimated to reduce the revenue to \$1,000,000, or one-fifth of the tax before the increase, while the other four-fifths and all the increase, or \$10,375,070, is to be taxed into the pockets of plate-makers." The shallowness or deceit of the views embodied in the report will be observed. The economic advantages to accrue to the wealth and industry of the country through the manufacture of these articles at home, giving employment to a share of the idle men referred to elsewhere in the report, are not mentioned.

#### AN ADVERSE REPORT WHICH REVERSES ITS OWN THEORIES.

The general conclusions of the bill advance some crude and novel doctrines of political economy. For instance, it says: "The census statistics show that before 1860 in the 250 years of their territorial and national existence our people accumulated and had, including their lands, property valued at \$14,000,000,000. In the 20 years since the war they have paid in national, State and local taxes, the greater part of it national taxes, a sum greater than all their savings in the 250 years. With the immensity of this draft upon the earnings of the people, their wealth was counted in the census of 1880 at \$22,000,000,000 in lands, in movable property as much more. How much of this wealth has been diverted or transferred by unequal and excessive taxation—by 'a high protective tariff,' which 'leads to monopoly'—from those who labor to those who employ labor, is largely a matter of conjecture. Of the 20,000,000 people who do something, some work or are engaged in gainful pursuits, 18,000,000, or nine-tenths, of these earn on the average not much more than \$300 a year, which is necessarily consumed in means of subsistence, while substantially all the savings go to the other one-tenth, and now we are overtaken by and are in the midst of industrial paralysis. A million of workmen are idle for want of work to do, and capital in still greater proportion than unemployed labor lies dead or unproductive. Our hills and mountains are full of mineral wealth; millions of acres of productive lands wait for the plow. Homes for homeless millions are to be had for the taking. There is an apparent puny effort in the bill, through an increase in taxation, to shut out goods from abroad that they may be made at home. If this effort could be so successful as to prevent the importation of all manufactures we would have direct taxation and 750,000 men yet unemployed. The last census estimates show an increased national wealth of \$30,000,000,000 for the previous 20 years. Marvelous as this growth from 1860 to 1880 may appear, it shows a yearly saving of only \$37.50 to every person of our then average of 40,000,000. Whatever number of persons save double the average yearly saving, or \$75, an equal number save nothing. For as many as acquired \$112.50, three times the average annual saving, a like number not only saved nothing, but fell the average yearly saving of \$37.50 short of the necessities of comfortable existence. Facts plain as these show how dangerously near the great mass of men always are to want and suffering."

#### MR. RANDALL WILL REPLY.

It is Mr. Randall's purpose to reply to the report of Mr. Morrison, in order to place himself on the record. He will doubtless take the first favorable occasion. His remarks will be made after careful consultation with his Democratic friends.

#### TRYING TO SHIFT THE ISSUE.

On Saturday, July 11, Mr. Morrison, who is evidently desirous of getting away from the issue which he has made on the tariff, as a privileged report from the Committee on Ways and Means reported a resolution fixing this day for the consideration of business from his committee, but not to include any bill raising revenue. Mr. Hewitt made a point of order against the resolution, which, however, was not sustained. The resolution passed by the decisive vote of 183 yeas to 34 nays. The vote was without partisan significance. Mr. Morrison's idea is to try to force his surplus proposition. It is expected that this will lead to a very general discussion of the tariff.

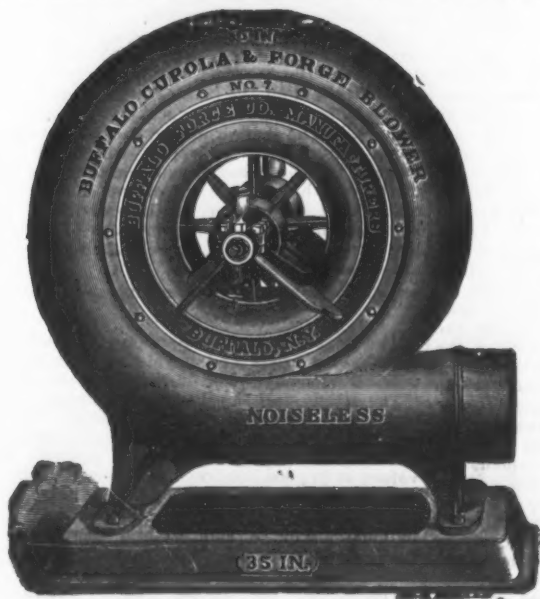
Bids for the rebuilding of the New Jersey State Capitol opened at Trenton on Tuesday and comprised the following: Thomas Suddall, of Trenton, for the plumbing and siding, \$1500. Titus & Conrad, of Trenton, for the carpenter-work, \$33,900. Elias Berl, of Newark, the plumbing, gas-fitting, &c., \$3800. Post & McCord, of New York, the ironwork, \$65,559. East River Iron Works, New York, the ironwork, \$76,980. Union Iron Works, of Trenton (Duncan Mackenzie), \$81,900. James W. Degnan, of Trenton, plumbing, steam and gas fitting, \$6863.06. Thomas Craig, of Trenton, plumbing, &c., \$6,716. F. S. Katzenback & Co., steam heating, \$3900; plumbing, \$3400; part of the copper and iron work, \$10,964. The Phoenix Iron Co., of Trenton, the ironwork, \$66,175. Baker, Smith & Co., of New York, steam heating, \$4189. Gillis & Geoghagan, of New York, steam heating, \$4000. Wilson Boiler Company, of New York, plumbing, gas and steam heating, \$6966. The total cost of the improvement is estimated at \$245,000.

A writer in Nature, basing his statements upon observations in India, maintains that there is a remarkable correspondence between the periodicity of an spots and the recurrence of high or low prices of wheat in that country, but as regards the United States facts are at variance with any such theory.

Westchester County is valued by the State assessors at \$59,000,000. Jay Gould's place at Irvington is said to be worth \$15,000,000, and Cyrus W. Field is assessed both in Irvington and Dobbs Ferry.



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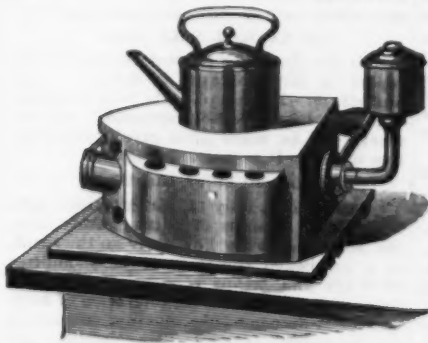


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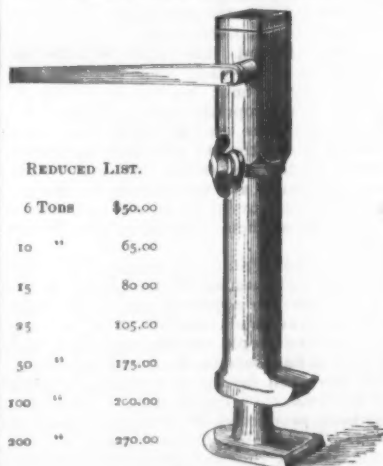
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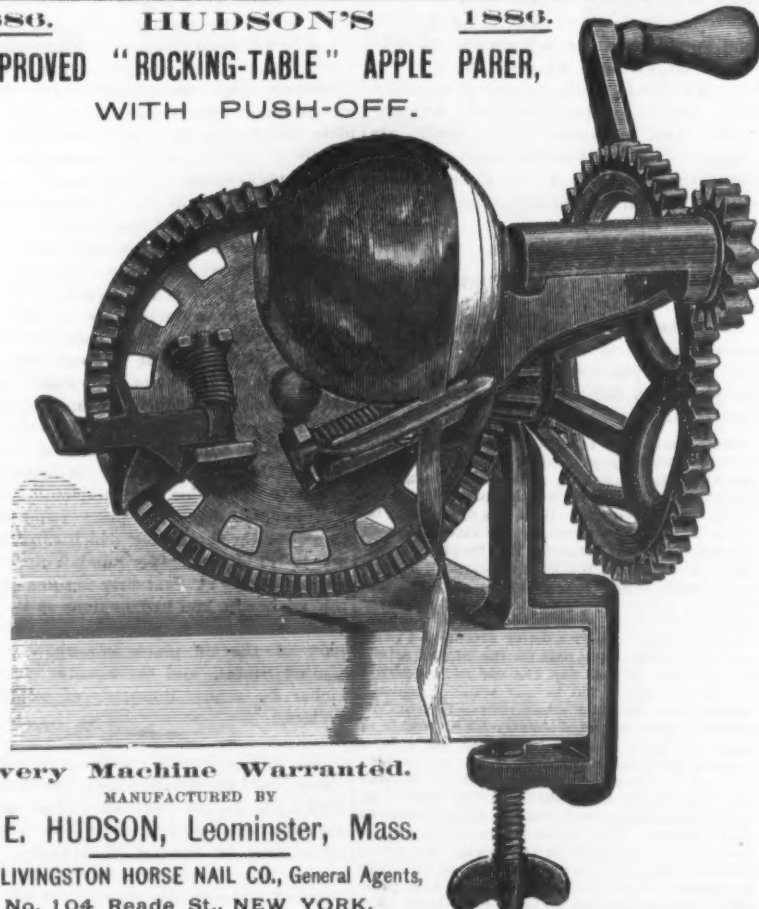
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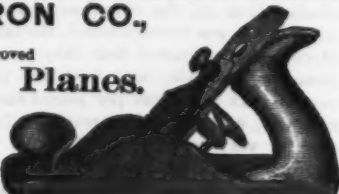
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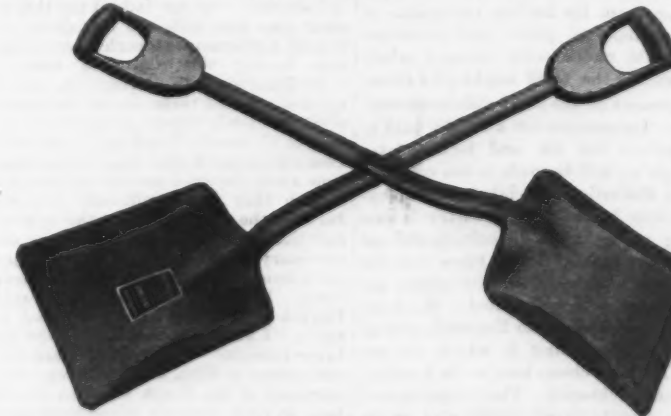
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Dudgeon Richard, 34 Columbia, N. Y.	10
Wagon & Sander, 20 Warren, N. Y.	10
Watson & Sullivan, 30 & 32 E. 4th, N. Y.	10
ICE BOX FASTENERS.	
Conroy F. J., Philadelphia, Pa.	30
White Mountain Freezer Co., Nashua.	32
ICE GRIPS.	
Little Giant Ice Grip Co., Phila.	34
INDICATORS.	
Montgomery & Co., 105 Fulton, N. Y.	10
Allen Amos, 100 Liberty, N. Y.	12
INSURANCE, COLLIER.	
Insurance Co. of Hartford, Conn.	34
IRON, MANUFACTURERS' AGENTS.	
Justice, Jr. & Co., 333 Walnut, Phila.	5
Hicks & Dickey, Buffalo, N. Y.	13
Hoffman J. W. & Co., 208 S. 4th, Phila.	4
Levin Henry & Co., Philadelphia.	4
Iron, MANUFACTURERS OF.	
Alan Wood Co., Philadelphia.	5
Burden Iron Co., Troy, N. Y.	4
Hargreaves & Co., Boston, Mass.	12
Kirkpatrick & Co., Pittsburgh, Pa.	4
Donald John, 100 Chambers, N. Y.	4
Monmouth & Co., Pittsburgh.	4
Monmouth Iron & Steel Co., Danville, Pa.	38
Monmouth Iron & Steel Co., Danville, Pa.	38
Pittsburgh Rolling Mill Co., Phila.	41
Boeken, Pa.	41
Pottsville Iron & Steel Co., Pottsville, Pa.	41
Riverside Iron Works, Washington, Va.	41
Stokes & Farrah Machine Co., Phila.	43
The Wilcox & Hobbs Mfg. Co., Bridgeport, Conn.	34
Tyrol Steel and Iron Co., Troy, N. Y.	4
Whitney A. & Co., 15 Hudson, N. Y.	4
Iron and Steel Co., 74 Chambers, N. Y.	24
Woodruff, Miller & Co., Mount Carmel, Conn.	31
IRON BROKERS.	
Edwards & Co., Philadelphia, Pa.	5
Fox John, 160 Broadway, N. Y.	41
Walsham W. H., Philadelphia, Pa.	41
IRON COMMISSION MERCHANTS.	
Hart Wm. & Co., Philadelphia, Pa.	5
John L. Hogan, Philadelphia, Pa.	5
John T. Talbot & Co., Philadelphia, Pa.	5
Landberg Gustaf, Boston, Mass.	37
Mohr J. J., 430 Walnut, Philadelphia.	37
Moore & R. Co., Philadelphia, Pa.	37
IRON DEALERS.	
Abel Brothers, 180 South, N. Y.	4
Abbott Jere & Co., Boston.	37
Bonell, Boston & Co., Youngstown.	37
Borden & Lovell, 70 and 72 West, N. Y.	4
Conroy Daniel, 100 Chambers, N. Y.	4
Cox Justice, Jr. & Co., Philadelphia.	4
Eberhart & Co., Philadelphia, Pa.	5
Blind Co., Philadelphia, Pa.	5
Hoffman J. W. & Co., 208 S. 4th, Phila.	4
Keeler James, 100 Chambers, N. Y.	4
Lindsay & Parvin, Philadelphia.	5
Landberg Gustaf, 35 Kilby, Boston.	37
Blind Co., Philadelphia, Pa.	5
Naylor & Co., 90 John, N. Y.	37
Ogden & Wallace, 85 to 91 Elm, N. Y.	4
Person & Co., 25 West, N. Y.	4
Pullman J. W., 165 Chambers, N. Y.	4
Wallace Wm. H. & Co., Albany & Washington.	4
Whitney A. & Co., 15 Hudson, N. Y.	4
Whitney A. & Co., 17 Broadway, N. Y.	4
IRON PIG IMPORTERS.	
Abel Brothers, 180 South, N. Y.	4
Page, Newell & Co., Boston, Mass.	37
IRON PLATES.	
Blind Co., Philadelphia, Pa.	5
Bretzel Geo. & Co., Rochester, N. Y.	30
IRON SHEET, MANUFACTURERS OF.	
Blind Co., Philadelphia, Pa.	5
Everson, Hammond & Co., Pittsburgh, Pa.	4
Leffler, Marshall & Co., 90 Beekman, N. Y.	4
Standard Iron Co., Bridgeport, Conn.	34
W. D. Wood & Co., Limited, Pittsburgh.	4
IRON, STEEL AND NAILS.	
Whitney A. & Co., 15 Hudson, N. Y.	4
IRONWORK, ORNAMENTAL.	
Champion Iron Fence Co., Keaton, O.	34
The Fred J. Myers Mfg. Co., Covington, Ky.	43
JACKS.	
Deane & Wolf, Black River, N. Y.	39
Eagle Lock Co., 98 Chambers, N. Y.	30
KEYS.	
Wolcott J. T., Chicago, Ill.	38
LACUERS.	
H. & Allen & Co., 112 John, N. Y.	39
BRASS LACUERS.	
Alford & Berkele Co., 77 Chambers, N. Y.	34
LOTHERS.	
Harrington E. & Son, Co., Philadelphia.	43
Fryhill P., 407 W. 40th, N. Y.	40
Sebastian, May & Co., Cincinnati, O.	28
BLAIR MFG. CO., SPRINGFIELD, MASS.	37
Chadbourne & Coldwell Mfg. Co., Newburgh, N. Y.	37
Haines A. & Co., 88 Chambers, N. Y.	12
Mant. Fox & Co., Springfield, Mass.	38
R. T. Soile & Co., Brockton, Mass.	38
LEMON DRILLS.	
Robinson E. C., Burlington, Vt.	36
LEMON SAWERS.	
Ripley Mfg. Co., Unionville, Conn.	53
LEVIES.	
Richardson C. F., Athol, Mass.	7
LOCKS AND KNOBS, MANUFACTURERS OF.	
Dietz A. E., 77 Chambers, N. Y.	24
Sadie Lee Co., 98 Chambers, N. Y.	24
Manhattan Hdw. Co., Reading, Pa.	40
Smith & Edge Mfg. Co., Bridgeport.	38

<b>Rolling Presses.</b> Kelsey & Co., Meriden, Conn. .... 31	Howland, Wm. & Harvey, Frankford, Pa. .... 1	
<b>Pallets.</b> Milburn Gin and Machine Co., Memphis, Tenn. .... 31	Phillips, Geo. & Co., Pittsburgh, Pa. .... 1	
Wadsworth & Co., Cleveland, O. .... 42	Singer, Nintco & Co., Pittsburgh, Pa. .... 1	
<b>Pumps, Force.</b> Field Force Pump Co., Lockport, N. Y. .... 7	Smith Bros. & Co., Philadelphia, Pa. .... 1	
Myers E. & Bro., Ashland, O. .... 34	The Bolton Steel Co., Canton, O. .... 1	
Union Mfg. Co., Chambers, N. Y. .... 7	The Wilmot & Hobbs Mfg. Co., Bridgeport, Conn. .... 1	
<b>Pumps, Makers of.</b> Clark Bros., Belmont, N. Y. .... 37	Troy Steel and Iron Co., Troy, N. Y. .... 1	
Douglas W. & R., Middletown, Conn. .... 7	Wardlaw & C., Sheffield, Eng. .... 1	
The Humphreys Mfg. Co., Nashville, Tenn. .... 37	<b>Steel, Manufacturers Agents.</b> Silver & Deming Mfg. Co., Salem, O. .... 7	Wheeler & Rogers, Philadelphia, Pa. .... 1
<b>Pumping Machinery.</b> Dean Bros. Steam Pump Works, Indianapolis, Ind. .... 34	<b>Steel, Sheet.</b> Standard Iron Co., Bridgeport, O. .... 1	
<b>Punching and Shearing Presses.</b> Buffalo Forge Co., Buffalo, N. Y. .... 16	<b>Steel Spiral Springs, Manufacturers.</b> Morritt & E., No. 20th, N. Y. .... 1	
Hearley Geo. W., Toledo, O. .... 38	Chaffin John & Sons, 85 to 89 Cliff, N. Y. .... 1	
Stiles & Parker, Trenton, N. J. .... 38	Howland Wm. & Harvey, Frankford, Pa. .... 1	
Conn. .... 38	<b>Steel, Tool.</b> Frankford Steel Co., Philadelphia, Pa. .... 1	
Watson & Stillman, 204 E. 43d, N. Y. .... 43	Joseph Wm. & Sons, Sheffield, Eng. .... 91	
<b>Rails, Iron and Steel.</b> Allentown Rolling Mills, Allentown, Pa. .... 5	Leong John S., Philadelphia, O. .... 1	
Cambridge Iron Co., Johnstown, Pa. .... 5	Smith Bros. & Co., Pittsburgh, Pa. .... 1	
Montour Iron & Steel Co., Danville, Va. .... 38	<b>Stocks and Dies.</b> Bullard & Co., Derby Line, Vt. .... 1	
Scranton Steel Rolling Co., Scranton, Pa. .... 38	The Billings & Spencer Co., Hartford, Conn. .... 1	
<b>Railway and Machinery Supplies.</b> N. Y. Supply Co., 50 & 52 John, N. Y. .... 13	Greenleaf Mfg. Co., Greenfield, Mass. .... 1	
Rogers H. A., 19 John, N. Y. .... 13	<b>Stove Linings.</b> Ostrander Jas. & Son, Troy, N. Y. .... 1	
<b>Railroad, Mill, and Mfrs. Supplies.</b> Greenleaf Steel & Co., 53 Chambers, N. Y. .... 32	<b>Stove Trucks.</b> Tucker & Dorsey Mfg. Co., Indianapolis, Ind. .... 1	
<b>Ratchets.</b> Ashcroft Mfg. Co., 111 Liberty, N. Y. .... 41	<b>Swings.</b> The F. F. Adams Co., Erie, Pa. .... 1	
<b>Ratchet Drills.</b> The Billings & Spencer Co., Hartford .... 1	<b>Tack and Nail Machinery.</b> Morritt & E., No. 20th, N. Y. .... 1	
<b>Razon.</b> J. B. Torrey & Co., Worcester, Mass. .... 10	<b>Tack and Shoe Nail Machinery.</b> Sweetser W. A., Brockton, Mass. .... 1	
<b>Refrigerators.</b> Heins & Munchauer, Buffalo, N. Y. .... 10	<b>Tacks and Staples.</b> American Tack Co., Fairhaven, Mass. .... 1	
Heins Geo. N., Co., Buffalo, N. Y. .... 10	Brooks, Plymouth, Mass. .... 1	
<b>Rivets.</b> Blake & Johnson, Waterbury, Conn. .... 3	Florence Tack Co., Florence, Mass. .... 1	
Grundy & Dismay, 105 Greenwch, N. Y. .... 13	Grundy & Dismay, 105 Greenwch, N. Y. .... 1	
Old Colony Mfg. Co., Kingston, Mass. .... 32	Heins Geo. N., Co., Buffalo, N. Y. .... 10	
Plymouth Mills, Plymouth, Mass. .... 32	Jenkins D. S., Brockton, Mass. .... 1	
Townsend W. F. & Co., Pittsburgh, Pa. .... 41	Keith & Trufant, Campbell, Mass. .... 1	
<b>Rock Drills.</b> Clark Bros., Brooklyn, N. Y., and New York City .... 44	Phillips E. S., Worcester, Mass. .... 1	
<b>Roller Bearings.</b> Chaplin Mfg. Co., Bridgeport, Conn. .... 34	Ripley & Bartlett, Plymouth, Mass. .... 1	
<b>Roofing.</b> Garry Iron Roofing Co., Cleveland, O. .... 8	<b>Tacks, Brads, &amp;c.</b> Wiley H. F. & Co., Plainville, Ct. .... 1	
<b>Rubber Goods.</b> Hartford Rubber Works, Hartford, Ct. .... 37	<b>Tacks, Nail.</b> Plymouth Mills, Plymouth, Mass. .... 1	
<b>Rules, Manufacturers of.</b> Stanley Rule & Level Co., 29 Chambers, N. Y. .... 37	<b>Taps and Dies.</b> Butterfield & Co., Derby Line, Vt. .... 1	
<b>Sad Irons.</b> Enterprise Mfg. Co., Philadelphia .... 38	Greenleaf Mfg. Co., Greenfield, Mass. .... 1	
Wm. H. Smith, 75 Maiden Lane, N. Y. .... 16	Wiley & Russell Mfg. Co., Greenfield, Mass. .... 1	
<b>Safety Lamps.</b> Schmitt E. J., 302 E. 76th, N. Y. .... 12	<b>Testing Machines.</b> Richie Bros., Philadelphia .... 1	
<b>Sap Spouts.</b> Post C. C., Burlington, Vt. .... 38	<b>Tire Benders.</b> Crawford & Flower and Forge Co., Lancaster, Pa. .... 1	
<b>Sash Cords and Chains.</b> Smith & Wadsworth, Bridgeport, Conn. .... 38	<b>Tire Upsetters.</b> Little Giant Mfg. Co., Millport, N. Y. .... 1	
Tolman J. P. & Co., Boston, Mass. .... 38	<b>Tools.</b> Little Giant Mfg. Co., Millport, N. Y. .... 1	
<b>Saw Sets.</b> Morritt, Chas., 44 College Place, N. Y. .... 34	<b>Tools.</b> Little Giant Mfg. Co., Millport, N. Y. .... 1	
Smith & Wadsworth, Bridgeport, Conn. .... 38	Atkins E. C. & Co., Indianapolis, Ind. .... 35	
<b>Saws, Makers of.</b> Atkins E. C. & Co., Indianapolis, Ind. .... 35	<b>Tools and Machines (Turners').</b> Niagara Stamping and Tool Co., Buffalo, N. Y. .... 1	
Diamond Saw Co., Boston, Mass. .... 32	<b>Tools, Water, Gas and Steam Fitters.</b> Arnold C. F., Bridgeport, Conn. .... 1	
<b>Scalps, Manufacturers of.</b> Buffalo Iron & Steel, Buffalo, N. Y. .... 32	<b>Towel Holders.</b> Haff & Co., Hartford, Conn. .... 1	
Chaffin John & Sons, 85 to 89 Cliff, N. Y. .... 9	<b>Tramway Lifters.</b> Lloyd & Supply Co., Philadelphia .... 1	
Chaplin Mfg. Co., Bridgeport, Conn. .... 34	Payson Mfg. Co., Chicago, Ill. .... 1	
E. L. Spencer's Sons, Guilford, Conn. .... 28	Reiber F. A. & Co., Chicago, Ill. .... 1	
Richie Bros., Philadelphia .... 1	Wollenkott J. F., Chicago, Ill. .... 1	
<b>Secreets, Window and Door.</b> Porter Mfg. Co., Burlington, Vt. .... 11	<b>Trucks, Manufacturers of.</b> Pennfield Block Co., Lockport, N. Y. .... 1	
<b>Screw Cutting Machinery.</b> Wiley & Russell Mfg. Co., Greenfield, Ind. .... 44	Richie Bros., 9th, above Master, Phila. .... 1	
<b>Screw Drivers.</b> Deacott Coffin Co., Decatur, Ill. .... 40	<b>The Scrapers.</b> Chambers Scrap Co., 419 Eighth, N. Y. .... 1	
Victor & Co., New York City .... 40	<b>Seams, Seamless Drawn Copper.</b> Bridgeport Brass Co., 19 Murray, N. Y. .... 1	
Graham J. H. & Co., 113 Chambers, N. Y. .... 8	<b>Seams, Steel.</b> Leong John S., Philadelphia, O. .... 1	
Kob G. F., Philadelphia, Pa. .... 35	<b>Seamless Buckles.</b> Cleveland City Forge and Iron Co., Cleveland, O. .... 1	
New England Specialty Co., North Easton, Mass. .... 40	Leong John S., 301 First st., Brooklyn, E. .... 1	
<b>Screw Plate and Pipe Cutter.</b> Jarecki Mfg. Co., Erie, Pa. .... 31	<b>Turning Woods.</b> Ripley Mfg. Co., Unionville, Conn. .... 1	
<b>Screws, Makers of.</b> Brooks & Johnson, 17th and Venango Sts., Philadelphia .... 13	<b>Twist Drills, Makers of.</b> Cleveland Twist Drill Co., Cleveland, O. .... 1	
Brace Geo. W. & P. Platt, N. Y. .... 9	Monroe & Johnson, 100 Bedford St., New Bedford, Mass. .... 1	
Wm. H. Haxell Co., Pawtucket, R. I. .... 41	New Process Twist Drill Co., Taunton, Mass. .... 1	
Mifflin F. S., 206 Quarry, Philadelphia, Pa. .... 6	Standard Tool Co., Pawtucket, R. I. .... 1	
<b>Scroll Saws.</b> Seneca Falls Mfg. Co., Seneca Falls, N. Y. .... 44	<b>Upright Drills.</b> Burnham Geo. & Co., Worcester, Mass. .... 1	
<b>Scythe Stones.</b> F. F. Mfg. Co., Pike Station, N. H. .... 16	Morritt E. & Co., Brockton, Mass. .... 1	
Berens & Huron Stone Co., Cleveland, O. .... 38	<b>Valve and Water Meter Makers.</b> Chapman Valve Mfg. Co., Boston, Mass. .... 1	
<b>Shafting, Makers of.</b> Cresson Geo. V., Philadelphia, Pa. .... 43	Leong John S., 301 First st., Brooklyn, E. .... 1	
Fluxion Co., 30 to 32 West, N. Y. .... 4	<b>Ventilating Apparatus.</b> Clark Geo. F., Windsor Locks, Conn. .... 1	
Sellers Wm. & Co., Philadelphia, and 70 Liberty, N. Y. .... 43	<b>Vices.</b> Eagle Anvil Works, Trenton, N. J. .... 1	
<b>Shears, Iron.</b> Watson & Stillman, 204 E. 43d, N. Y. .... 43	Howland Wm. & Harvey, Frankford, Pa. .... 1	
<b>Shears and Scissors.</b> Acme Shear Co., Bridgeport, Conn. .... 37	Pratt & Whitney, Hartford, Conn. .... 1	
Clayton Bros., Bristol, Conn. .... 37	Reid Vise Co., 25 Day, N. Y. .... 1	
Henry Seymour Cutlery Co., 84 Champlain St., Buffalo, N. Y. .... 37	<b>Vulcanized Fibre.</b> Vulcanized Fibre Co., 15 Day, N. Y. .... 1	
Norfolk Shear Co., Norfolk, Conn. .... 37	<b>Wagon Jacks.</b> Haggard, W. S., Lafayette, Ind. .... 1	
Southworth W. & Co., New Haven, Conn. .... 36	<b>Washing Machines.</b> Baughman N. C., York, Pa. .... 1	
<b>Ship Chandlery.</b> Crescent Geo. H. & Co., Reading, N. Y. .... 36	<b>Water Gages.</b> Richie Bros., Philadelphia, O. .... 1	
<b>Ship Chandlery Hardware.</b> Shelton Brass Hardware Co., Birmingham, Conn. .... 36	<b>Whetstones.</b> A. F. Pike Mfg. Co., Pike Station N. H. .... 1	
<b>Shovels, Spades and Scoops.</b> Brace Geo. W. & P. Platt, N. Y. .... 9	<b>White Lead.</b> Atlantic White Lead and Linseed Oil Co., 100 Pearl, N. Y. .... 1	
Hussey, Hams & Co., Pittsburgh, Pa. .... 10	Jewett John & Sons, 182 Front, N. Y. .... 1	
<b>Show Cases.</b> Farley & Hoffman, Rochester, N. Y. .... 6	Lewis John T. & Bro., 393 S. Front, Phila. .... 1	
<b>Sinks.</b> Douglas W. & R., Middletown, Conn. .... 7	<b>Window Screens.</b> Vaine, Deich & Co., Philadelphia, Pa. .... 1	
Kilbourne & Jacobs Mfg. Co., Columbus, Mo. .... 39	<b>Wire and Ironwork.</b> Barnum E. T., Detroit, Mich. .... 1	
<b>Silverware.</b> R. Wallace & Sons Mfg. Co., Wallingford, Conn. .... 34	<b>Wire, Manufacturers of.</b> Gaulter Steel Department of Cambridge Iron Co., 100 Pearl, N. Y. .... 1	
<b>Skis, Roller.</b> Hensley M. C., Richmond, Ind. .... 6	Cary & Moon, 234 W. 20th, N. Y. .... 1	
Smith & Wadsworth, Bridgeport, Conn. .... 38	Hartman Steel Co., Pittsburgh, Pa. .... 1	
<b>Soldering Furnaces.</b> Daugler Store & Mfg. Co., Cleveland, O. .... 41	Prentiss Geo. W. & Co., Holyoke, Mass. .... 1	
<b>Soldering Irons.</b> Crescent Mfg. Co., West Troy, N. Y. .... 36	Salem Wire Nail Co., Salem, O. .... 1	
<b>Spinning Tools.</b> Ostrander W. R. & Co., 21 & 23 Ann, N. Y. .... 1	Washburn & Moen Mfg. Co., Worcester, Mass. .... 1	
<b>Spelter.</b> Manning & Squier, 113 Liberty, N. Y. .... 9	<b>Wire Cloth.</b> Hartman Steel Co., Pittsburgh, Pa. .... 1	
<b>Spring Hinges.</b> Morcan Spring Co., Worcester, Mass. .... 39	Wickwire Iron, Cortland, N. Y. .... 1	
Sabin Machine Co., Montpelier, Vt. .... 40	W. S. Tyler Wire Goods Co., Cleveland, Vt. .... 1	
Tuck Mfg. Co., Brockton, Mass. .... 35	<b>Wire Goods.</b> Hartman Steel Co., Pittsburgh, Pa. .... 1	
<b>Spring Hinges.</b> Morcan Spring Co., Worcester, Mass. .... 39	<b>Wire Goods, Manufacturers of.</b> Brooks M. S., Chester, Conn. .... 1	
Van Wagoner & Williams, 83 Beckman, N. Y. .... 44	Gilbert & Bennett Mfg. Co., 45 Cliff, N. Y. .... 1	
<b>Spriakers.</b> Ray & Ford & Berkeley Co., 77 Chambers, N. Y. .... 28	Howard & Morse, 45 Fulton, N. Y. .... 1	
<b>Stable Fixtures.</b> T. Fred. J. & Sons Mfg. Co., Covington, Ky. .... 3	E. Jackson Mfg. Co., Pawtucket, R. I. .... 1	
<b>Stamping Works.</b> Friedrich & Sons, 100 Broadway, N. Y. .... 1	Vaine, Deich & Co., Philadelphia, Pa. .... 1	
<b>Steam Hammers, &amp;c., Makers of.</b> Budgeon & Rankin, 24 Columbia, N. Y. .... 10	<b>Wire and Ironwork.</b> Barnum E. T., Detroit, Mich. .... 1	
<b>Steam Pumps, &amp;c., Manufacturers.</b> A. S. Cameron Steam Pump Works, foot of East Twenty-third St., N. Y. .... 13	<b>Wire, Manufacturers of.</b> Cambridge Iron Co., 100 Pearl, N. Y. .... 1	
McGowan John H. & Co., Cincinnati, O. .... 42	Cary & Moon, 234 W. 20th, N. Y. .... 1	
Norwalk Iron Wks. Co., So. Norwalk, Conn. .... 42	Hartman Steel Co., Pittsburgh, Pa. .... 1	
<b>Steel Figures and Alphabets.</b> Bellevue & Co., Philadelphia, Pa. .... 32	Prentiss Geo. W. & Co., Holyoke, Mass. .... 1	
Steelman J. M., 181 William, N. Y. .... 9	Salem Wire Nail Co., Salem, O. .... 1	
<b>Steel Importers.</b> Hobson Francis & Son, 97 John, N. Y. .... 39	Washburn & Moen Mfg. Co., Worcester, Mass. .... 1	
Joseph Wm. & Sons, Sheffield, Eng. .... 91	<b>Wire Mesh.</b> Hartman Steel Co., Pittsburgh, Pa. .... 1	
Montgomery & Co., 105 Fulton, N. Y. .... 10	<b>Wire Nail and Tack Machines.</b> Birmingham Iron Foundry, Birmingham, Ala. .... 1	
Newton & Shipman, 39 John, N. Y. .... 36	Hernsheim L., 16 & 18 Exchange place, N. Y. .... 1	
Phillips E. S., Worcester, Mass. .... 1	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	<b>HP. Nail Co., Cleveland.</b> A. Field & Sons, Taunton, Mass. .... 1	
<b>Steel (Machines) Special.</b> Burrows Steel Co., 90-101 John, N. Y. .... 6	Phillips E. S., Worcester, Mass. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Phillips E. S., Worcester, Mass. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Plymouth Mills, Plymouth, Mass. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Prentiss Geo. W. & Co., Holyoke, Mass. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	The Wire Goods Co., Worcester, Mass. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
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Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
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Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
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Burgess Steel Co., 90-101 John, N. Y. .... 6	Whitney A. B. & Co., 17 Broadway, N. Y. .... 1	
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6284 feet of 3/4-inch Cold-Rolled Shafting.  
502 Hangers.  
300 Couplings.  
57 feet of 3-inch Cold-Rolled Shafting.  
53 Hangers.  
25 Couplings.  
1885 feet of 1-inch Cold-Rolled Shafting.  
94 Pillow Blocks.  
97 Couplings.  
292 feet of 1-inch Cold-Rolled Shafting.  
28 Pillow Blocks.  
70 Couplings.  
All cold-rolled and in first-class condition, having been but little used at the late Exposition, at very low prices.  
SHAKEPEARE, SMITH & CO.,  
No. 219 Girard St., New Orleans, La.

## OR PARTNER WANTED

**FOR SALE**, to manufacture, a patented Bung-Borer, a new invention; the best thing out for the purpose; correspondence solicited.  
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## Cash Advances Upon Iron.

## PENNSYLVANIA WAREHOUSING

**AND SAFE DEPOSIT CO.,**  
Girard Building, 34 St., below Chestnut, Philadelphia.  
This Company is prepared to establish yards throughout the Iron regions at small cost, and to make advances at moderate rates of interest.  
F. R. FERNBENTON, President.  
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GEO. H. EARLE, Jr., Solicitor.  
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## NEW LOCATION WANTED

## FOR MANUFACTURING.

A manufacturing concern, long and well established, desired to make a change from a small place with no railroad to some live town of 2000 or over. The line of goods is a very fine one, and sell to the Hardware Trade. About 100 of the best class of mechanics are employed, and the number can be largely increased. This is a rare chance for some good place to secure one of the finest branches of manufacturing. Correspondence is solicited, setting forth advantages, inducements, &c.  
"MANUFACTURER,"  
Office of The Iron Age, 66 and 68 Duane St., N. Y.

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LARGE SIZE, 500 Pages, 6 x 9 1/4 in. each, \$2.00.  
POCKET SIZE, 250 Pages, 4 x 7 in., each, \$1.00.  
Send for Circulars.

## B. LAMBERSON,

## PORTLAND, OREGON.

## Wanted to Buy

Iron and Steel Scrap of all descriptions, such as Old Iron and Steel Wire Rope, burnt and Mallesbale Iron Rails, &c., &c.  
We have for sale Pig Iron, Merchant Bar Iron, Sheet Iron, Nails, &c.  
SITES, GILL & CO.,  
222 and 224 So. Third Street,  
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- 10 in. x 42 in. Planer. Bridgeport. New. . . . . \$1.00
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- 24 in. x 52 ft. . . . . \$1.00
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- 24 in. x 58 ft. . . . . \$1.00
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- 24 in. x 64 ft. . . . . \$1.00
- 24 in. x 66 ft. . . . . \$1.00
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- 24 in. x 78 ft. . . . . \$1.00
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- 24 in. x 86 ft. . . . . \$1.00
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- 24 in. x 96 ft. . . . . \$1.00
- 24 in. x 98 ft. . . . . \$1.00
- 24 in. x 100 ft. . . . . \$1.00

## SCRAP IRON.

We buy all kinds of Iron and Steel Scrap, Burnt Iron, Old Rails, &c., &c. Write us, naming quantity, price, &c.  
ROBINSON & ORR,  
115 Water St., Pittsburgh







# Trade Report.

## New York.

**American Pig.**—The market is quiet, without any new features whatever. We print editorially this week the results of an inquiry into the consumption and production of Bessemer Pig Iron, which has an important bearing on the situation in other grades.

**Scotch Pig.**—Low freights from this side are tending to produce stiffer figures for the freights bound for this way. We quote nominally as follows for small lots: Coltness, \$19.75 @ \$20 to arrive; Gartsherrie, \$19 @ \$19.25 to arrive; Shotts and Langloan, \$19.50 @ \$20 to arrive; Carnbroe and Glengaraock, \$18.50 @ \$19 to arrive; Summerlee, \$19.50 @ \$19.75 to arrive; Dalmellington, \$18.50 @ \$18.75 to arrive; Eglinton, \$17.50 @ \$18 to arrive, and Clyde, \$18 @ \$18.50 to arrive.

**Bessemer Pig.**—No sales either of Foreign or Domestic are reported in this market. We quote Foreign nominally \$18.75 @ \$19, and Domestic \$18 @ \$18.25 at furnace, for ordinary quality.

**Spiegel.**—We hear of a sale of 3000 tons to a Pennsylvania mill at a low figure. We quote English, large lines, \$25 @ \$25.25, and German \$24.75 @ \$25.

**Bar Iron.**—The market remains fairly steady. We continue to quote for delivery here in round lots: Common Iron, 1.65¢ @ 1.70¢; Medium, 1.70¢ @ 1.75¢, and Refined Iron, 1.75¢ @ 1.80¢. Store prices are 1.75¢ @ 1.80¢ for Common, 1.85¢ @ 1.90¢ for Medium, and 1.9¢ @ 2.2¢ for Refined.

**Structural Iron and Steel.**—A number of the leading mills are better employed than they have been for a long time past, and with considerable local business coming up the feeling is one of greater encouragement. Values remain unchanged. We quote for Angles 2¢ @ 2.10¢, delivered, and Tees at 2.40¢ @ 2.45¢, for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.25¢ @ 2.4¢ for Angles, and 2.6¢ @ 2.7¢ for Tees. American Beams and Channels are nominally 3¢ base from dock for all orders.

**Plates.**—Some of the mills claim to be doing better, but viewing the situation generally it is not changed. We quote for round lots: Common or Tank, 2.10¢ @ 2.20¢; Refined, 2.4¢ @ 2.45¢; Shell, 2.4¢ @ 2.45¢; Flange, 3.4¢ @ 3.5¢; Extra Flange, 4¢ @ 4.4¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.70¢ @ 2.75¢; Ship, 3¢; Shell, 3.4¢; Flange, 3.5¢, and Fire-Box, 4¢ @ 4.5¢, on dock.

**Merchant Steel.**—We quote nominally for the range of ordinary to good grades as follows: American Tool Steels, 7.5¢ @ 9¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13¢ @ 15.5¢; common grades, 7¢ @ 9¢; Crucible Machinery, 3.75¢ @ 4.50¢; Round and Flat Spring, 2.3¢ @ 2.5¢; Round-Edge Tire, 2.3¢ @ 2.5¢; Square-Edge Tire, 2.60¢ @ 2.7¢; Toe Calk, 2.6¢; Sleigh Shoes, 2.5¢ @ 2.6¢; Open-Hearth Machinery, 2.4¢ @ 2.6¢, and Bessemer Machinery, 2.15¢ @ 2.25¢, with freight allowance.

**Steel Wire Rods.**—Some very low offers have been made lately. Current business is moderate. We continue to quote nominally \$38 @ \$38.50.

**Steel Rails.**—We are reported sales aggregating about 10,000 tons to Eastern railroads at previous terms, and there are rumors of sales of about 10,000 tons more. The allotment has been increased to 1,400,000 gross tons. There are a number of negotiations on foot for Foreign Rails, chiefly for delivery at Gulf ports, the figure to be met being about \$38. We continue to quote \$34 @ \$35, according to size of order, time of delivery, &c.

**Old Rails.**—No transactions whatever are reported in this market. Southern Rails are offered in vain at \$19, delivered either Baltimore, Philadelphia or New York, without takers. Large blocks of Old Rails are held by a number of railroad companies, and the marketing of some one of them from time to time suffices to cover the current demand, which is comparatively light. There is no demand for Old Steel Rails.

**Scrap.**—We note a sale of 300 tons of No. 1 Railroad at terminus at \$18, and 500 tons Cast Scrap at \$13.

**Rail Fastenings.**—We quote nominally 2.40¢, delivered, for Spikes, and 1.80¢ @ 2¢ for Angle Fish Bars.

## Philadelphia.

Office of The Iron Age, 280 South Fourth St., PHILADELPHIA, July 13, 1886.

**Pig Iron.**—The market has been exceedingly dull for the past two or three weeks, and there is no indication of an immediate break in the monotony. Consumers of Iron have been doing nothing whatever since the first of the month, and very few are thinking of doing anything before the 15th; some will not begin even then. Consequently there is but little more need of Iron than there was a month ago, although in the meantime the furnaces have been producing about the same as usual, and in many instances have piled up considerable quantities. Buyers see their advantage, and are not inclined to place orders to any extent, unless at materially lower prices. As yet concessions have been somewhat exceptional,

but there is no question that the tendency of the market is in buyers' favor, and from present appearance it will be almost impossible to move large lots at what are called regular market rates. Some holders would doubtless be willing to meet buyers' views, but bids are not always made to those most anxious for them, which is probably one reason that there is so little actual business to report. Some leading companies have declined proposals for large lots, simply because they have a great many orders on their books, and see no object in making quotations which may after all not be necessary by the time they are in a position to make deliveries. Others, as we have said, are anxious for a market, and will probably make concessions on anything like fair offers for good-sized lots. The outlook is still thought to be favorable for a large fall trade, but the immediate disappointment is because things do not start up at once. There is nothing to lead one to suppose that there will be much improvement for a week or two, and if the present inactivity continues prices may sag off yet a little more. Quotations range from \$18.25 to \$19 at tide for standard brands of No. 1 Foundry; \$19.50 for special brands, \$17 @ \$18.25 for standard No. 2, and \$15.75 @ \$16.25 for standard Gray Forge. Southern Irons are offered at \$15.50, \$16.50 and \$17.50, ex ship, for the three grades, but there is no demand, although on firm offers there is little doubt that concessions would be made.

**Bessemer Iron.**—There is nothing doing in Foreign, which is offered for shipment at \$19 @ \$19.50, according to brand. Spiegel is offered at \$21.50 for 10 @ 12¢ and \$25.50 for 20¢, with no transactions of recent date. Sales of large lots made from Foreign Ore have been made at about \$19, delivered at Rail mills, which is much below what Pig Metal could be imported for.

**Blooms.**—There is not much doing at present, although Rail Blooms have been largely sold at from \$25.50 to \$27, ex ship; Slabs for Nail Plate, \$29 @ \$30 at tide for Foreign and \$30 at mill for Domestic, and from that to \$35 for higher qualities; special grades for Boiler Plates and other uses requiring high tensile strength, \$34 @ \$38. Other Blooms as follows: Charcoal, \$52 @ \$54; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$33 @ \$34, and Ore Blooms, \$34 @ \$35.

**Muck Bars.**—There is very little demand, and prices are easy at \$28 @ \$28.50, according to location of mill, quality of Bar, &c.

**Bar Iron.**—The mills in this vicinity are all closed and have been for the past two weeks, and probably will be for some time longer. There is no perceptible change in the market, however. Pittsburgh and other outside points are quoting very low prices for Philadelphia deliveries, but the demand is so light that there is really very little business to report. The outlook is not encouraging for this department of the Iron trade, and without some very unforeseen change the mills will be likely to remain idle for a long time yet. Prices are about 1.6¢ @ 1.65¢ for common quality of Bars, 1.7¢ @ 1.75¢ for good medium, and 1.8¢ for best refined.

**Plate and Tank Iron.**—There is not much general demand, but this is in a measure offset by the demand for special shapes and for Ship Plates; about 1500 tons of the latter have been taken, some for Wilmington, but chiefly for the Philadelphia shipyards. Prices are still low, about 2¢, delivered, being named for Ship Plates, and other grades in proportion. The mills have not started up yet and the outlook is not specially encouraging, although it is expected that work will be generally resumed next week. Prices about as follows: Ordinary Plate, 2.05¢ @ 2.1¢; Tank, 2.1¢ @ 2.2¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¢.

**Structural Iron.**—There has been a gradual picking up of orders for some time past, and a fair average amount of work has been secured. Some of the larger concerns are fuller than they have been for months, and are correspondingly firm in prices. Others are still somewhat anxious about the future, and are taking contracts at the old prices sooner than risk losing an order. The outlook is better, however, and an active demand in the near future seems pretty well assured. Prices about as follows: 2¢ @ 2.05¢, delivered, for Angles; 2.1¢ @ 2.2¢ for Bridge Plate; 2.4¢ @ 2.5¢ for Tees, and 3¢ for Beams and Channels.

**Sheet Iron.**—The demand is still somewhat disappointing, although nearly all the mills are running full and without any great accumulation of stocks. Prices are very irregular, however, and while the best makes are firmly held others sell at all sorts of prices. For small lots quotations are about as follows:

Best Refined, Nos. 26, 27 and 28..... 35¢  
Best Refined, Nos. 18 to 25..... 34¢  
Common, 14¢ less than the above.  
Best Bloom Sheets, Nos. 26 to 28..... 44¢ @ 5¢  
Best Bloom Sheets, Nos. 21 to 25..... 44¢ @ 45¢  
Best Bloom Sheets, Nos. 16 to 21..... 39¢ @ 4¢  
Blue Annealed..... 2.6¢ @ 2.70¢  
Best Bloom, Galvanized, discount..... 60¢  
Common, discount..... 65¢

**Steel Rails.**—No change to note in any respect. The demand is still large, and prices are held with absolute firmness, \$35 at mill being the usual quotation, possibly \$34.50 on very desirable orders, and for deliveries in 1887 \$34 might perhaps be accepted. Sellers are not urging business, however, as they have about all they can handle for some months to come.

**Old Rails.**—Nothing has been done in this market for some time past, although sellers

are anxious for business. Bids of \$19 are asked for lots for shipment, but no one seems inclined to make an offer. That figure or more could probably be had for lots near at hand, but shipments from abroad are not wanted. A sale of Double Bells was made yesterday at \$20, ex ship Baltimore, including some T's at same figure.

**Scrap Iron.**—Prices are steadily maintained, although there is not a great deal of business doing at present. A cargo lot of No. 1 Scrap sold at \$18, ex ship, and a cargo of Fish Plates on private terms. Prices about as follows: No. 1 Wrought Scrap, \$18.50 @ \$20; No. 2 do., \$13 @ \$14; Turnings, \$14 @ \$14.50; Old Car Wheels, \$15 @ \$16; Old Steel Rails, \$18.50 @ \$20; Fish Plates, \$23 @ \$24; Cast Scrap, \$14 @ \$15; do. Turnings, \$10 @ \$10.50.

**Wrought-Iron Pipe.**—There is no change in prices, which are firmly held at last week's discounts, say Lap-Welded Black, 57½¢; Butt-Welded Black, 42½¢; Butt-Welded Galvanized, 32½¢; Lap-Welded Galvanized, 40¢; Boiler Tubes, 52½¢. Large sizes and Boiler Tubes are very scarce, the demand for Pipe for natural gas keeping the mills running to their fullest capacity.

**Nails.**—A much better feeling prevails, and prices are firmly established at \$2.20 from store. There seems to be complete unanimity among makers, and a firm and steady market is confidently predicted.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., July 13, 1886.

There is a decidedly better feeling in business circles, and, while there has been no perceptible improvement in general business as yet, the indications are that there soon will be. There is more business in the aggregate than at this time last year, notwithstanding orders have been small for some time past, neither jobbers nor consumers apparently being disposed to buy beyond immediate actual wants. Our manufacturers generally are hopeful of a good fall trade. Experiments are being made with a view of having natural gas take the place of Coke in blast furnaces, and if they should be successful the Coke trade will be very much curtailed. Pittsburgh furnacemen are again talking of new Ore fields which they hope to be able to take advantage of before long. They now have an eye on the fields of Minnesota recently opened up.

**Pig Iron.**—There has been no important change in the situation since our report of this day week; trade continues dull; the demand is still of a hand-to-mouth character, while prices remain unchanged. However, the outlook in regard to Finished Iron is favorable, and if the expectations now entertained are realized an increased demand for Pig Iron will soon follow, as the mills are pretty generally running. The consumption is large for this month, and as a rule consumers have light stocks, which will soon have to be replenished. The fact that there is not much disposition to anticipate future wants does not look as though consumers were apprehensive of higher prices. Southern Irons are still being offered pretty freely, and, while mill owners generally refuse to buy them, they do not hesitate to make use of them in bearing the market on home-made Iron; by this means, chiefly, they have succeeded in forcing the latter down from 50¢ to 75¢ per ton, although there has been but little of the former sold here. Bessemer Iron continues dull, although some large lots are under negotiation and may be closed within a few days; \$18, cash, still appears to be the ruling price, although it is said that offers to sell have been made at \$17.75, cash. Quotations may be fairly given as follows:

No. 1 Neutral Gray Forge.....\$16.00 @ \$16.35, 4 mos.  
No. 2 Neutral Gray Forge..... 15.50 @ 15.75, 4 "  
White and Mottled..... 14.50 @ 15.25, 4 "  
All-Ore Mill..... 17.00 @ 17.50, 4 "  
No. 1 Foundry..... 18.00 @ 18.25, 4 "  
No. 2 Foundry..... 18.75 @ 17.25, 4 "  
All-Ore Foundry..... 18.50 @ 19.00, 4 "  
Cold Blast Charcoal..... 24.00 @ 27.00, 4 "  
Foundry Charcoal..... 30.00 @ 33.00, 4 "  
Bessemer Iron..... 18.00 @ ....., cash.

The freight rate on Pig Iron, all rail from Georgia and Alabama to Pittsburgh, is about \$4 per ton. Home furnacemen are disposed to criticize the railroads for giving such a low rate on Iron that is brought here to be placed in competition with home Irons. It is claimed that there is no money in it to the railroads, none to the Southern furnacemen, and, at the same time, it hurts the market here.

**Muck Bar.**—There have been no sales reported recently, in the absence of which we quote at \$27 @ \$27.50, cash, as to quality, delivery, &c.

**Manufactured Iron.**—There is a fair and increasing business, and the indications at present point to at least an average fall trade; some think it will be above an average. Makers of Agricultural Implements will be on the market before long, and jobbers, who as a rule are low in stock, will soon be sending forward orders. It is expected also that the railroads generally will be free buyers from now on to the close of the year. A great many new cars are being built and other railroad repairs and improvements made which will require large quantities of Iron, and it is expected, therefore, that there will be a good fall trade. Prices are still quoted on a basis of 1.65¢ @ 1.70¢ for first quality Iron, and 1½¢ @ 1½¢ for Old Rail Iron. A good many buyers are willing to pay the difference for the former.

**Nails.**—While some of the factories have been started up, it will take some time to work up an assorted stock, and manufacturers will not be in condition to do much for a week or two yet. Iron Nails are still quoted at \$1.00, 60 days, 2¢ off for cash, in carlots and upward, and Steel at 10¢ @ 15¢ per keg additional. Chess, Cook & Co., Shoenberger & Co. and Jones & Laughlins have started up their factories, and it is probable that Zug & Co. and Moorhead Bros. will soon follow. The outlook is considered favorable for a fair fall trade, and it is thought that prices will stay about where they are. Makers say there is no room for any further cut. The regular monthly meeting of the Western Nail Association takes place here this week, and it is expected, now that the strike is over, that there will be a pretty full attendance.

**Wrought-Iron Pipe.**—The factories are all busy and likely to continue so until the advent of cold weather. Prices firm at card rates; there will be no cutting as long as mills have all they can do, as is now the case. The regular monthly meeting takes place in this city, if we mistake not, on the 20th inst. Black Butt-Welded in carlots, 45¢; Galvanized do., 35¢; Black Lap-Welded, 60¢; Galvanized do., 42½¢. Less than a carload, discount 2½¢ less than rates quoted; Boiler Tubes, 52½¢ off; ½-inch Casing, 45¢ per foot, net; 2-inch Oil-Well Tubing, 14¢, net; 8-inch Drive Pipe, \$1.30.

**Steel.**—The general position of the Steel trade remains much the same as noted in last report; some branches are active enough, while others are dull. Prices remain unchanged. Best brands Refined Cast Tool Steel, 8¢ @ 9¢; Crucible Machinery, 3¼¢ @ 4¢; Open-Hearth do., 2½¢; do., Plow Slabs, 3¢; Bessemer Blooms and Billets, \$30 @ \$32; Bloom Ends nominal at \$20 @ \$20.50; Rail Ends, \$20 @ \$21.50.

**Old Rails.**—There is some inquiry for Old Iron Rails, with but few offering, and the market is firmer, but prices remain unchanged at \$21. There is considerable inquiry from mills out in the Shenango and Mahoning valleys; consumers here, especially the larger ones, are pretty well stocked. Old Steel Rails continue dull, and in the absence of sales may be quoted nominally at \$20 for short and \$22 for long lengths.

**Steel Rails.**—Both the Edgar Thomson and Homestead mills continue very busy, and it is intimated that they have orders enough booked and in sight to keep them going until the close of the year. The Edgar Thomson Works, it is said, are turning out about 3500 tons per week. Prices remain unchanged at \$36 @ \$36.50, cash, at mill, for heavy sections.

**Railway Track Supplies.**—There is a fair demand; no change in prices. Spikes, 2.40¢, 30 days, delivered; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2.75¢, with Square and 2.85¢ @ 3¢ with Hexagon Nuts.

**Old Material.**—There appears to be an increasing demand, and prices are firmer, but without change. No. 1 Wrought Scrap, \$18, net ton; Wrought Turnings, \$14 @ \$15; Old Car Axles, \$23 @ \$24; Cast Borings, \$11 @ \$12, gross; Old Wheels, \$16, gross.

Messrs. Everson, Hammond & Co., Limited, Pennsylvania Iron Works, Pittsburgh, announce under date of July 1 that Mr. Wm. M. Orr has sold and transferred all his interest in the firm of Everson, Hammond & Orr, Limited, to W. J. Hammond, Jr., and has withdrawn from the firm. W. J. Hammond, Jr., has been admitted to membership and the firm name has been changed to Everson, Hammond & Co., Limited. The business of the manufacture of Sheet Iron and Steel will be continued under the name of Everson, Hammond & Co., Limited.

## Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., Chicago, July 13, 1886.

**Hardware.**—Notwithstanding the holiday time a fair trade in the general line of Hardware is reported. Country merchants evidently have light stocks, and therefore require replenishing very frequently, judging from the quantity of seasonal and unseasonable goods ordered through the mail. Midsummer trade is generally made up from this class of orders, but the break into the season's business during May makes it a greater feature this year than customary. On future business Chicago jobbers are not pushing. There seems to be a general aversion to selling goods in advance in this market, with the exception of several staple lines upon which prices are guaranteed by manufacturers. For the season trading has been fairly good, and we hear of very little complaining among the leading houses. The general tendency on prices is upward, though not many established changes have yet been announced. In addition to the advance on the lines mentioned last week, all kinds of Socket Chisels, Dripping Pans and Wire Nails are now included in the change of price, which on the former lines is an average of about 10¢. Manufacturers of other lines are notifying jobbers that they contemplate new price lists, and from all that can be gleaned in the trade there appears to be a firmness in figures that will materially alter present selling prices.

**Barb Wire.**—There is very little demand for Barb Wire at the present time, and prices are consequently weak. Many of the manufacturers have lost faith in the

possibility of pooling the product and thus relieving themselves from the burden of heavy stocks. Under these conditions it is not surprising to hear of sales being made at considerably less than the accepted market price. Buyers of carloads are not numerous, but occasionally a nifty dealer comes into the market and reaps the benefit of its present condition. Jobbers continue to quote small lots from store at 3½¢ for Painted Wire and 4¼¢ for Galvanized. They have very little demand for carloads, and usually are undersold by makers if the buyer becomes known to the trade. A great deal of hard, earnest work has been done in the way of completing the pool by the secretary of the manufacturers' association and several of the leading members, but there is nothing so far to warrant the prediction that their efforts will ever be crowned with success. There are dissatisfied members in the manufacturers' association who seldom ever get what they want, and in this last scheme want exactly what they know they cannot get. This being the situation, there is more probability of the Wire association disintegrating than of its becoming more effectual in its beneficent control of the market.

**Nails.**—In a general way the Nail market shows some very agreeable features. Thus far the adoption of a satisfactory scale between nailers and manufacturers, and the starting up of several new mills, has not, contrary to expectation, weakened the price. The market, upon the other hand, is more regular, and if anything stronger, at prices quoted than during the month of June. Jobbers quote Iron Nails from store in small lots at \$2.10, and Steel Nails at \$2.20, 5¢ off in carload lots. The demand is said to be very fair, and considerable inquiry for carlots, both for present and future delivery. With the increased supply of Western Nails Eastern manufacturers find it more difficult to place orders in the West, and are apparently inclined to withdraw from the market in preference to cutting prices. Judging from the prices made by manufacturers of Nails delivered in Chicago the above quotations are bottom, with very little probability of a further reduction. Upon the other hand, there is at the moment no visible cause why Nails should advance, as the supply will undoubtedly be greater than the demand for the next 30 days at least, but it is believed by the trade that manufacturers will not permit the market to be overstocked.

**American Pig Iron.**—Taking a retrospective view of the market for the last 60 days, its present condition is certainly very flattering. One can scarcely realize that change will occur so rapidly and yet not materially affect prices. Furnacemen have large amounts of money invested in their plants, have heavy obligations to meet every week and month, and cannot shirk them under any consideration without closing down their furnaces, through which they would incur heavy losses in money and time. No sales of importance were made during May, and the increase in supply was considerably greater than generally stated. With June matters began to improve. Buyers were more liberal in their views, and the revival of confidence among manufacturers did much to relieve the situation among furnacemen. Much of the surplus Iron that had accumulated immediately after the suppression of business through strikes has been placed, and that, too, at figures very little below the previous market value, which at once made a firm foundation on which to support prices. With this firmness underlying the trade, furnacemen have experienced no great difficulty in re-establishing the confidence among manufacturers that Iron would not further decline. The numerous inquiries which have been in the market recently for small and large lots have increased their independence, until they now name their figures, which must be met by consumers or no sale. Purchasers who recently have been taking only carload lots have changed to placing orders for 100 to 300 tons, scattered over three to six months' delivery. Quotations on Charcoal Irons for such lots are made at \$19.50, and in carloads the same Iron is quoted at \$20 @ \$20.50. Negotiations are in progress which if completed would take up all the surplus Iron of this grade now visible. In addition thereto there are inquiries on the market of a speculative nature, including other brands that would be closed immediately if suitable prices could be obtained. The demand for Coke Irons is very good, but less active than for some of the others. Quotations range from \$9 to \$19.50, in small lots, with very little shading for large quantities. Cinder-Mixed Irons continue steady at \$18, and Ohio Standard Blackbands firm at \$20 @ \$20.50. There are several makes of Iron in this class that are shaded according to the quantity of Blackband Ore which they contain. There is no change in the condition of the market for Southern Iron. Quotations on No. 1 Foundry continue to be \$17.50 @ \$18; No. 2, \$17; No. 2½, \$16 @ \$16.50; No. 3, \$15.50. So long as this Iron continues in such ready supply there is no chance for an increase in price. Manufacturers are ready to accept orders at even less figures than quoted, and the amount of concessions they would grant depends very largely on the quantity the buyer would take. The general market in all particulars appears satisfactory to sales agents and furnacemen, who look for a strong, steady demand for the balance of the year. It is not



Forsythe, Hyde & Co., Pig-Iron merchants, Chicago, have been appointed sales agents for the entire product of the furnace located at Black River Falls, Wis. This iron will be known as the Minneapolis Lake Superior Charcoal. The furnace will go into blast about July 20, and has a capacity of 60 tons per day. It is their purpose at the outset to use exclusively Lake Superior Ores in making Foundry, Cast-Iron, Wheel, Malleable and Bessemer Iron, but to contemplate trying the Ores found in the Michigan region later on.

**Pig Iron**—Like everything else, is quiet, and nothing has turned up to bring out any special mention. Nearly all of the output of the furnaces is finding a market and

Pig Iron.			
Southern Coke, No. 1 Foundry.....	\$16.00 @	\$17.00	
"    "    No. 2.....	15.00 @	16.00	
"    "    No. 3.....	14.50 @	15.50	
"    "    No. 3 1/2.....	14.50 @	15.50	
"    "    No. 4.....	14.50 @	15.50	
"    "    No. 4 1/2.....	14.50 @	15.50	
"    "    No. 5.....	14.50 @	15.50	
"    "    No. 5 1/2.....	14.50 @	15.50	
"    "    No. 6.....	14.50 @	15.50	
"    "    No. 6 1/2.....	14.50 @	15.50	
"    "    No. 7.....	14.50 @	15.50	
"    "    No. 7 1/2.....	14.50 @	15.50	
"    "    No. 8.....	14.50 @	15.50	
"    "    No. 8 1/2.....	14.50 @	15.50	
"    "    No. 9.....	14.50 @	15.50	
"    "    No. 9 1/2.....	14.50 @	15.50	
"    "    No. 10.....	14.50 @	15.50	
"    "    No. 10 1/2.....	14.50 @	15.50	
"    "    No. 11.....	14.50 @	15.50	
"    "    No. 11 1/2.....	14.50 @	15.50	
"    "    No. 12.....	14.50 @	15.50	
"    "    No. 12 1/2.....	14.50 @	15.50	
"    "    No. 13.....	14.50 @	15.50	
"    "    No. 13 1/2.....	14.50 @	15.50	
"    "    No. 14.....	14.50 @	15.50	
"    "    No. 14 1/2.....	14.50 @	15.50	
"    "    No. 15.....	14.50 @	15.50	
"    "    No. 15 1/2.....	14.50 @	15.50	
"    "    No. 16.....	14.50 @	15.50	
"    "    No. 16 1/2.....	14.50 @	15.50	
"    "    No. 17.....	14.50 @	15.50	
"    "    No. 17 1/2.....	14.50 @	15.50	
"    "    No. 18.....	14.50 @	15.50	
"    "    No. 18 1/2.....	14.50 @	15.50	
"    "    No. 19.....	14.50 @	15.50	
"    "    No. 19 1/2.....	14.50 @	15.50	
"    "    No. 20.....	14.50 @	15.50	
"    "    No. 20 1/2.....	14.50 @	15.50	
"    "    No. 21.....	14.50 @	15.50	
"    "    No. 21 1/2.....	14.50 @	15.50	
"    "    No. 22.....	14.50 @	15.50	
"    "    No. 22 1/2.....	14.50 @	15.50	
"    "    No. 23.....	14.50 @	15.50	
"    "    No. 23 1/2.....	14.50 @	15.50	
"    "    No. 24.....	14.50 @	15.50	
"    "    No. 24 1/2.....	14.50 @	15.50	
"    "    No. 25.....	14.50 @	15.50	
"    "    No. 25 1/2.....	14.50 @	15.50	
"    "    No. 26.....	14.50 @	15.50	
"    "    No. 26 1/2.....	14.50 @	15.50	
"    "    No. 27.....	14.50 @	15.50	
"    "    No. 27 1/2.....	14.50 @	15.50	
"    "    No. 28.....	14.50 @	15.50	
"    "    No. 28 1/2.....	14.50 @	15.50	
"    "    No. 29.....	14.50 @	15.50	
"    "    No. 29 1/2.....	14.50 @	15.50	
"    "    No. 30.....	14.50 @	15.50	
"    "    No. 30 1/2.....	14.50 @	15.50	
"    "    No. 31.....	14.50 @	15.50	
"    "    No. 31 1/2.....	14.50 @	15.50	
"    "    No. 32.....	14.50 @	15.50	
"    "    No. 32 1/2.....	14.50 @	15.50	
"    "    No. 33.....	14.50 @	15.50	
"    "    No. 33 1/2.....	14.50 @	15.50	
"    "    No. 34.....	14.50 @	15.50	
"    "    No. 34 1/2.....	14.50 @	15.50	
"    "    No. 35.....	14.50 @	15.50	
"    "    No. 35 1/2.....	14.50 @	15.50	
"    "    No. 36.....	14.50 @	15.50	
"    "    No. 36 1/2.....	14.50 @	15.50	
"    "    No. 37.....	14.50 @	15.50	
"    "    No. 37 1/2.....	14.50 @		

The German Government is about to try the use of basic steel in place of Swedish iron for the manufacture of horseshoe nails.

and particularly of French colonial products.



# Trade Report.

## General Hardware.

There is at present a full in the trade, and buyers are generally waiting for the publication of the new prices, which are in preparation by manufacturers. In most lines a feeling of firmness is observable, which in many quarters may be called decided strength. It is not likely that manufacturers will accumulate stocks under existing conditions, and thus what has often proved an element of weakness in the market will be absent at least from the immediate future. In the record of changes for the week there will be found many more advances than reductions, and it is generally felt that this will be the case for some time.

### BARB WIRE.

Midsummer dullness is the rule in the Barb Wire trade, with quotations unchanged in the New York market.

### NAILES.

An effort is being made to lift the Eastern Nail trade out of the demoralized condition in which it has been for about two months. Last Friday a number of manufacturers met at Philadelphia and decided to put the card rate at \$2.20, with the usual discount of 10 cents for round lots. To-morrow (Thursday) a meeting is to be held in this city, which, it is generally believed, will ratify that decision. The grounds on which this movement is based may be summarized as follows: It is conceded generally that the prices at which Nails have been selling, say \$1.80 on dock in carload lots, in many instances are ruinous to even the most favorably circumstanced concerns. The low prices have caused the closing down of the majority of the New England mills, and have caused others in Eastern and Central Pennsylvania to run short time or to accumulate a part of their make. A number of the works have been idle for summer repairs, and others are expected to suspend operations for the same reason in the near future. This amounts practically to the usual curtailment of capacity during this season of the year. It is urged that during the recent decline manufacturers and their agents have been careful not to sell to speculators, and that on the whole a very small percentage of the sales during that period was for other than immediate consumption. Therefore the maintenance of an advance would not be rendered impossible by resales to realize profits. It is insisted, furthermore, that for at least a month to come, there is no danger of a diversion of notable quantities of Nails from Western works to this market. On the other hand, no action has been taken so far to guard against an excessive production by Eastern works through an agreement to stop the Nail machines. It appears that every one is at liberty to run as best it may suit him. We hear of a proposed agreement, to which signatures are to be appended by the sellers, accompanied by a deposit of funds as a guarantee of good faith, and it is urged that even \$2.10 on dock is not any great inducement to driving plant to full capacity. But it is not considered likely that the former plan will be carried through, and the latter argument does not seem to carry conviction to the minds of the sellers. The sharp competition of the past months has left its traces of bitter feeling and distrust, and, while the movement meets with the cordial good wishes of the entire trade, there is still as we write an undercurrent of uncertainty. This may be dispelled by the meeting to be held to-morrow. Whatever the outcome of the movement may be, it proves that manufacturers are thoroughly aroused, and that in the near future the low prices made lately will not be repeated. At the present writing the situation is not yet clearly defined, nor can it be expected to become so until the attitude of buyers is ascertained.

### WIRE NAILS.

The Wire Nail manufacturers held a meeting at the Fifth Avenue Hotel, in this city, on the 8th inst., for the purpose of considering a standard price list and list of sizes which had been prepared by Mr. M. Baaches, of the HP Nail Company, to whom this work had been delegated at a previous meeting. The list of sizes and prices as adopted is given herewith. The object of the list of sizes is to overcome the difficulty which has grown to so important proportions not only to makers, but the trade at large, of the enormous variety of sizes and shapes of the goods made by various manufacturers and the lack of uniformity between the different makers. Under the new system, by which the Nails are designated in the same way as Cut Nails are, the number of varieties is reduced to about 200, and it is expected by the manufacturers that goods made by this list will serve for more than 95 per cent. of the entire trade. The base price was made \$3.75 per keg of 100 pounds for rod, to which, for the other sizes and kinds, additions are to be made by the accompanying table, exactly as in the case of Cut Nails. The allowances for quantity are to be continued for Common Standard Nails, to wit: On orders for 25 kegs, 5 cents per keg less; 50 kegs, 10 cents; 100 kegs, 15 cents; 200 kegs or more, 20 cents. Actual freight will be allowed not to exceed 15 cents per keg.

These prices apply only to the goods made by the standard list of sizes, packed in 100 pound kegs. For all package goods and sizes not found in the standard list, as well as for quantities of less than a keg, the list of April 13, 1886, will still be used, the discount being fixed by the meeting at 50 and 10 per cent. The following is the

### STANDARD LIST OF EXTRAS ON STEEL WIRE NAILS.

Common, Fence, Flooring Brads, Shingle and Tobacco Nails. Add to the price of 100 Com.

Size.	Length of Nail.	Rate.
10d-60d.	3 in. to 6 in.	.....
8d & 9d.	2 1/2 in. & 3 1/4 in.	.....
6d & 7d.	2 in. & 2 1/4 in.	.....
4d & 5d.	1 1/2 in. & 1 3/4 in.	.....
3d.	1 1/4 in.	.....
2d.	1 in.	.....

Barbed Common.

10d-60d.	3 in. to 6 in.	.....
8d & 9d.	2 1/2 in. & 3 1/4 in.	.....
6d & 7d.	2 in. & 2 1/4 in.	.....
4d & 5d.	1 1/2 in. & 1 3/4 in.	.....
3d.	1 1/4 in.	.....
2d.	1 in.	.....

Casing and Box, Smooth.

10d-60d.	3 in. to 6 in.	.....
8d & 9d.	2 1/2 in. & 3 1/4 in.	.....
6d & 7d.	2 in. & 2 1/4 in.	.....
4d & 5d.	1 1/2 in. & 1 3/4 in.	.....
3d.	1 1/4 in.	.....
2d.	1 in.	.....

Barbed Box 25 cents additional to Smooth Box.

Finishing Nails, Smooth.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d & 5d.	1 1/2 in. & 1 3/4 in.	.....
6d & 7d.	2 in. & 2 1/4 in.	.....
8d & 9d.	2 1/2 in. & 3 1/4 in.	.....
10d-2d.	3 in. to 4 in.	.....

Barbed Finishing Nails 25 cents additional to Smooth.

Fine Nails.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d.	1 1/2 in.	.....

Lining Nails.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d.	1 1/2 in.	.....

Barrel Nails.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d.	1 1/2 in.	.....

Slating Nails.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d.	1 1/2 in.	.....

Barbed Roofing Nails.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d.	1 1/2 in.	.....

Barbed Oval Head Car Nails, Light and Heavy.

4 1/2.	1 1/2 in.	.....
5d.	1 3/4 in.	.....
6d & 7d.	2 in. & 2 1/4 in.	.....
8d & 9d.	2 1/2 in. & 3 1/4 in.	.....
10d-60d.	3 in. to 6 in.	.....

Clinch Nails.

2d.	1 in.	.....
3d.	1 1/4 in.	.....
4d & 5d.	1 1/2 in. & 1 3/4 in.	.....
6d-20d.	2 in. to 4 in.	.....

Wire Spikes.

All sizes.	3 in. to 9 in.	.....
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The sale of Tacks on Tuesday and Wednesday of this week was by no means largely attended, very few important jobs being present. Most of the goods were bought by the large Tack makers, and as a rule at prices above the present bottom quotations.

The manufacturers of Cordage have advanced the price of Sisal 1/2 cent a pound, making the list prices as follows:

Sisal.	1/2 inch and larger	.....
Sisal.	1/4 inch	.....
Sisal.	1/8 inch	.....
Sisal.	1/16 inch	.....
Sisal.	1/32 inch	.....
Sisal.	1/64 inch	.....
Sisal.	1/128 inch	.....
Sisal.	1/256 inch	.....
Sisal.	1/512 inch	.....
Sisal.	1/1024 inch	.....
Sisal.	1/2048 inch	.....
Sisal.	1/4096 inch	.....
Sisal.	1/8192 inch	.....
Sisal.	1/16384 inch	.....
Sisal.	1/32768 inch	.....
Sisal.	1/65536 inch	.....
Sisal.	1/131072 inch	.....
Sisal.	1/262144 inch	.....
Sisal.	1/524288 inch	.....
Sisal.	1/1048576 inch	.....
Sisal.	1/2097152 inch	.....
Sisal.	1/4194304 inch	.....
Sisal.	1/8388608 inch	.....
Sisal.	1/16777216 inch	.....
Sisal.	1/33554432 inch	.....
Sisal.	1/67108864 inch	.....
Sisal.	1/134217728 inch	.....
Sisal.	1/268435456 inch	.....
Sisal.	1/536870912 inch	.....
Sisal.	1/1073741824 inch	.....
Sisal.	1/2147483648 inch	.....
Sisal.	1/4294967296 inch	.....
Sisal.	1/8589934592 inch	.....
Sisal.	1/17179869184 inch	.....
Sisal.	1/34359738368 inch	.....
Sisal.	1/68719476736 inch	.....
Sisal.	1/137438953472 inch	.....
Sisal.	1/274877906944 inch	.....
Sisal.	1/549755813888 inch	.....
Sisal.	1/1099511627776 inch	.....
Sisal.	1/2199023255552 inch	.....
Sisal.	1/4398046511104 inch	.....
Sisal.	1/8796093022208 inch	.....
Sisal.	1/17592186044416 inch	.....
Sisal.	1/35184372088832 inch	.....
Sisal.	1/70368744177664 inch	.....
Sisal.	1/140737488355328 inch	.....
Sisal.	1/281474976710656 inch	.....
Sisal.	1/562949953421312 inch	.....
Sisal.	1/1125899906842624 inch	.....
Sisal.	1/2251799813685248 inch	.....
Sisal.	1/4503599627370496 inch	.....
Sisal.	1/9007199254740992 inch	.....
Sisal.	1/18014398509481984 inch	.....
Sisal.	1/36028797018963968 inch	.....
Sisal.	1/72057594037927936 inch	.....
Sisal.	1/144115188075855872 inch	.....
Sisal.	1/288230376151711744 inch	.....
Sisal.	1/576460752303423488 inch	.....
Sisal.	1/1152921504606846976 inch	.....
Sisal.	1/2305843009213693952 inch	.....
Sisal.	1/4611686018427387904 inch	.....
Sisal.	1/9223372036854775808 inch	.....
Sisal.	1/18446744073709551616 inch	.....
Sisal.	1/36893488147419103232 inch	.....
Sisal.	1/73786976294838206464 inch	.....
Sisal.	1/147573952589676412928 inch	.....
Sisal.	1/295147905179352825856 inch	.....
Sisal.	1/590295810358705651712 inch	.....
Sisal.	1/1180591620717411303424 inch	.....
Sisal.	1/2361183241434822606848 inch	.....
Sisal.	1/4722366482869645213696 inch	.....
Sisal.	1/9444732965739290427392 inch	.....
Sisal.	1/18889465931478580854784 inch	.....
Sisal.	1/37778931862957161709568 inch	.....
Sisal.	1/75557863725914323419136 inch	.....
Sisal.	1/151115727451828646838272 inch	.....
Sisal.	1/302231454903657293676544 inch	.....
Sisal.	1/604462909807314587353088 inch	.....
Sisal.	1/1208925819614629174706176 inch	.....
Sisal.	1/2417851639229258349412352 inch	.....
Sisal.	1/4835703278458516698824704 inch	.....
Sisal.	1/9671406556917033397649408 inch	.....
Sisal.	1/19342813113834066795298816 inch	.....
Sisal.	1/38685626227668133590597630336 inch	.....
Sisal.	1/77371252455336267181195260672 inch	.....
Sisal.	1/154742504910672534362390521344 inch	.....
Sisal.	1/309485009821345068724781042688 inch	.....
Sisal.	1/618970019642690137449562165376 inch	.....
Sisal.	1/1237940039285380274899244330752 inch	.....
Sisal.	1/2475880078570760549798488661504 inch	.....
Sisal.	1/4951760157141521099596977323008 inch	.....
Sisal.	1/9903520314283042199193954646016 inch	.....
Sisal.	1/19807040628566084398387909212032 inch	.....
Sisal.	1/39614081257132168796775818424064 inch	.....
Sisal.	1/79228162514264337593551636848128 inch	.....
Sisal.	1/158456325028528675187103273696256 inch	.....
Sisal.	1/316912650057057350374206547392512 inch	.....
Sisal.	1/633825300114114700748413094785024 inch	.....
Sisal.	1/1267650600228229401496826189570048 inch	.....
Sisal.	1/2535301200456458802993652379140096 inch	.....
Sisal.	1/5070602400912917605987304758280192 inch	.....
Sisal.	1/10141204801825835211974609516560384 inch	.....
Sisal.	1/20282409603651670423949219033120768 inch	.....
Sisal.	1/40564819207303340847898438066241536 inch	.....
Sisal.	1/81129638414606681695796876132483072 inch	.....
Sisal.	1/162259276829213363391593752264966144 inch	.....
Sisal.	1/324518553658426726783187504529932288 inch	.....
Sisal.	1/649037107316853453566375009059864576 inch	.....
Sisal.	1/1298074214633706907132750018119729152 inch	.....
Sisal.	1/2596148429267413814265500036239458304 inch	.....
Sisal.	1/5192296858534827628531000072478916608 inch	.....
Sisal.	1/10384593717069655257062000144977833216 inch	.....
Sisal.	1/20769187434139310514124000289955666432 inch	.....
Sisal.	1/41538374868278621028248000579911332864 inch	.....
Sisal.	1/83076749736557242056496001159822665728 inch	.....
Sisal.	1/166153499473114484112992002319645331456 inch	.....
Sisal.	1/332306998946228968225984004639290662912 inch	.....
Sisal.	1/664613997892457936451968009278581325824 inch	.....
Sisal.	1/1329227995784915872903936018557162651648 inch	.....
Sisal.	1/2658455991569831745807872037114325303296 inch	.....
Sisal.	1/5316911983139663491615744074228650606592 inch	.....
Sisal.	1/10633823966279326983231488148457301213184 inch	.....
Sisal.	1/21267647932558653966462976296914602426368 inch	.....
Sisal.	1/42535295865117307932925952593829204852736 inch	.....
Sisal.	1/85070591730234615865851905187658409705472 inch	.....
Sisal.	1/170141183460469231731703810375316819410944 inch	.....
Sisal.	1/340282366920938463463407620750633638821888 inch	.....
Sisal.	1/680564733841876926926815241501267277643776 inch	.....
Sisal.	1/1361129467683753853853630483002534555287552 inch	.....
Sisal.	1/2722258935367507707707260966005069110575104 inch	.....
Sisal.	1/5444517870735015415414521932010138221150208 inch	.....
Sisal.	1/10889035741470030830829043864020276442300416 inch	.....
Sisal.	1/21778071482940061661658087728040552884600832 inch	.....
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Sisal.	1/102844034832575377634695551573226303030925924730795703772299395072 inch	.....
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Sisal.	1/822752278660603021077564412585810424247407397846365630178395160576 inch	.....
Sisal.	1/1645504557321206042155128825171620848494814795692731260356790321152 inch	.....
Sisal.	1/3291009114642412084310257650343241696989629591385462520713580642304 inch	.....
Sisal.	1/6582018229284824168620515300686483393979259182770925041427161284608 inch	.....
Sisal		



4. No. 158, Butts, new list, as follows.....	60	80, English Bronzed Bolts, 3004, and 3014, make	235, Door Pulls, excepting 307, 308 (the English	418-420, Axle Pulleys.....	48
2 x 2 3/4 x 2 3/4 x 2 3/4 3 x 2 3/4 3 x 3	2.50 3.00 3.50 4.00 4.50	void, see Tokio Bronzed Goods.....	Bronzed are void.....	421, Dumb Waiter Pulleys.....	55
3 x 3 3/4 x 3 3/4 x 3 3/4 4 x 3 3/4 4 x 4	3.50 4.00 4.50 5.00 5.50	81, Barrel Bolts, No. 272 1/2, 472, 482.....	236, Door Pulls, excepting 308 (English Bronzed	422, Ceiling Pulleys.....	55
4 1/2 x 4 1/2 x 5 1/2 x 5 1/2 5 1/2 x 4 1/2 5 1/2	5.50 6.00 6.50 7.00 7.50	82, Barrel Bolts, No. 272 1/2, 472, 482.....	are void, see Tokio Bronzed Goods.....	423, Hot House Pulleys.....	55
5 1/2 x 5 1/2 x 6 1/2 x 6 1/2 6 1/2 x 5 1/2 6 1/2	8.00 8.50 9.00 9.50 10.00	83, Elm City Barrel Bolts.....	237-241, Door Pulls.....	424, Upright Pulleys.....	55
6 1/2 x 6 1/2 x 7 1/2 x 7 1/2 7 1/2 x 6 1/2 7 1/2	10.00 10.50 11.00 11.50 12.00	84, Elm City Barrel Bolts.....	242-251, Drawer Pulls.....	425, Side Pulleys.....	55
7 1/2 x 7 1/2 x 8 1/2 x 8 1/2 8 1/2 x 7 1/2 8 1/2	12.00 12.50 13.00 13.50 14.00	85, No. 320, Neck Bolts.....	252-260, Drawer Pulls, excepting the English	426, Incased Swivel Pulleys, No. 42.....	55
8 1/2 x 8 1/2 x 9 1/2 x 9 1/2 9 1/2 x 8 1/2 9 1/2	14.00 14.50 15.00 15.50 16.00	86, No. 423, Neck Bolts.....	Bronzed Goods which are void.....	427, Clothes Line Pulleys, Nos. 63 and 163.....	55
9 1/2 x 9 1/2 x 10 1/2 x 10 1/2 10 1/2 x 9 1/2 10 1/2	16.00 16.50 17.00 17.50 18.00	87, No. 325, Neck Bolts.....	261, Drawer Pulls.....	428-429, Clothes Line Pulleys.....	55
10 1/2 x 10 1/2 x 11 1/2 x 11 1/2 11 1/2 x 10 1/2 11 1/2	18.00 18.50 19.00 19.50 20.00	88, No. 316, Wrought Spring Bolts.....	262-263, Drawer Pulls.....	430, Clothes Line Pulleys, No. 64.....	55
11 1/2 x 11 1/2 x 12 1/2 x 12 1/2 12 1/2 x 11 1/2 12 1/2	20.00 20.50 21.00 21.50 22.00	89, Wrought Spring Bolts.....	264-265, Drop Handles and Escutcheons.....	431, Extra Heavy Pulleys.....	55
12 1/2 x 12 1/2 x 13 1/2 x 13 1/2 13 1/2 x 12 1/2 13 1/2	22.00 22.50 23.00 23.50 24.00	90-91, Wrought Square Bolts.....	266, Drop Handles.....	432, Well Wheels, change list of No. 1, 12, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.....	55
13 1/2 x 13 1/2 x 14 1/2 x 14 1/2 14 1/2 x 13 1/2 14 1/2	24.00 24.50 25.00 25.50 26.00	92, No. 300, Square Bolts.....	267, Brackets and Handles.....	433, Hay Fork Pulleys.....	55
14 1/2 x 14 1/2 x 15 1/2 x 15 1/2 15 1/2 x 14 1/2 15 1/2	26.00 26.50 27.00 27.50 28.00	93, Cast Brass Square Bolts.....	268-269, Lifting Handles.....	434, Hay Fork Pulleys (No. 272 is void).....	55
15 1/2 x 15 1/2 x 16 1/2 x 16 1/2 16 1/2 x 15 1/2 16 1/2	28.00 28.50 29.00 29.50 30.00	94, Square Cased Bolts, excepting 1302.....	270, No. 25, Shelf Box Handles.....	435, Brass Pulleys.....	55
16 1/2 x 16 1/2 x 17 1/2 x 17 1/2 17 1/2 x 16 1/2 17 1/2	30.00 30.50 31.00 31.50 32.00	No. 1302, English Bronzed, make void, see	271, Brass Ring Handles.....	436, Brass Pulleys.....	55
17 1/2 x 17 1/2 x 18 1/2 x 18 1/2 18 1/2 x 17 1/2 18 1/2	32.00 32.50 33.00 33.50 34.00	Tokio Goods.....	272, Brass Ring Handles.....	437, Brass Upright Pulleys.....	55
18 1/2 x 18 1/2 x 19 1/2 x 19 1/2 19 1/2 x 18 1/2 19 1/2	34.00 34.50 35.00 35.50 36.00	95, Square Cased Bolts.....	273, Brass Ring Handles.....	438-439, Line Cleats.....	55
19 1/2 x 19 1/2 x 20 1/2 x 20 1/2 20 1/2 x 19 1/2 20 1/2	36.00 36.50 37.00 37.50 38.00	No. 801, Square Cased Bolts.....	274, Brass Ring Handles.....	440-441, Shelf Brackets.....	55
20 1/2 x 20 1/2 x 21 1/2 x 21 1/2 21 1/2 x 20 1/2 21 1/2	38.00 38.50 39.00 39.50 40.00	No. 300, Square Cased Bolts.....	275, Brass Ring Handles.....	442, Shelf Brackets (make void No. 40).....	55
21 1/2 x 21 1/2 x 22 1/2 x 22 1/2 22 1/2 x 21 1/2 22 1/2	40.00 40.50 41.00 41.50 42.00	No. 300, Square Cased Bolts.....	276, Brass Ring Handles.....	443, Brass-Plated S Brackets, change list.....	55
22 1/2 x 22 1/2 x 23 1/2 x 23 1/2 23 1/2 x 22 1/2 23 1/2	42.00 42.50 43.00 43.50 44.00	No. 300, Square Cased Bolts.....	277, Brass Ring Handles.....	No. 544, 3 x 4 5 x 5 5 x 7 6 x 8	55
23 1/2 x 23 1/2 x 24 1/2 x 24 1/2 24 1/2 x 23 1/2 24 1/2	44.00 44.50 45.00 45.50 46.00	No. 300, Square Cased Bolts.....	278, Brass Ring Handles.....	No. 545, 6.50 7.00 8.00 8.50	55
24 1/2 x 24 1/2 x 25 1/2 x 25 1/2 25 1/2 x 24 1/2 25 1/2	46.00 46.50 47.00 47.50 48.00	No. 300, Square Cased Bolts.....	279, Brass Ring Handles.....	No. 546, 9.00 9.50 11.00	55
25 1/2 x 25 1/2 x 26 1/2 x 26 1/2 26 1/2 x 25 1/2 26 1/2	48.00 48.50 49.00 49.50 50.00	No. 300, Square Cased Bolts.....	280, Brass Ring Handles.....	449-452, Shelf Brackets.....	55
26 1/2 x 26 1/2 x 27 1/2 x 27 1/2 27 1/2 x 26 1/2 27 1/2	50.00 50.50 51.00 51.50 52.00	No. 300, Square Cased Bolts.....	281, Brass Ring Handles.....	453-453, Hand Rail Brackets.....	55
27 1/2 x 27 1/2 x 28 1/2 x 28 1/2 28 1/2 x 27 1/2 28 1/2	52.00 52.50 53.00 53.50 54.00	No. 300, Square Cased Bolts.....	282, Brass Ring Handles.....	454, Hand Rail Brackets.....	55
28 1/2 x 28 1/2 x 29 1/2 x 29 1/2 29 1/2 x 28 1/2 29 1/2	54.00 54.50 55.00 55.50 56.00	No. 300, Square Cased Bolts.....	283, Brass Ring Handles.....	455, Hand Rail Brackets.....	55
29 1/2 x 29 1/2 x 30 1/2 x 30 1/2 30 1/2 x 29 1/2 30 1/2	56.00 56.50 57.00 57.50 58.00	No. 300, Square Cased Bolts.....	284, Brass Ring Handles.....	456, Hand Rail Brackets.....	55
30 1/2 x 30 1/2 x 31 1/2 x 31 1/2 31 1/2 x 30 1/2 31 1/2	58.00 58.50 59.00 59.50 60.00	No. 300, Square Cased Bolts.....	285, Brass Ring Handles.....	457, Hand Rail Brackets.....	55
31 1/2 x 31 1/2 x 32 1/2 x 32 1/2 32 1/2 x 31 1/2 32 1/2	60.00 60.50 61.00 61.50 62.00	No. 300, Square Cased Bolts.....	286, Brass Ring Handles.....	458, Hand Rail Brackets.....	55
32 1/2 x 32 1/2 x 33 1/2 x 33 1/2 33 1/2 x 32 1/2 33 1/2	62.00 62.50 63.00 63.50 64.00	No. 300, Square Cased Bolts.....	287, Brass Ring Handles.....	459, Hand Rail Brackets.....	55
33 1/2 x 33 1/2 x 34 1/2 x 34 1/2 34 1/2 x 33 1/2 34 1/2	64.00 64.50 65.00 65.50 66.00	No. 300, Square Cased Bolts.....	288, Brass Ring Handles.....	460, Hand Rail Brackets.....	55
34 1/2 x 34 1/2 x 35 1/2 x 35 1/2 35 1/2 x 34 1/2 35 1/2	66.00 66.50 67.00 67.50 68.00	No. 300, Square Cased Bolts.....	289, Brass Ring Handles.....	461, Hand Rail Brackets.....	55
35 1/2 x 35 1/2 x 36 1/2 x 36 1/2 36 1/2 x 35 1/2 36 1/2	68.00 68.50 69.00 69.50 70.00	No. 300, Square Cased Bolts.....	290, Brass Ring Handles.....	462, Hand Rail Brackets.....	55
36 1/2 x 36 1/2 x 37 1/2 x 37 1/2 37 1/2 x 36 1/2 37 1/2	70.00 70.50 71.00 71.50 72.00	No. 300, Square Cased Bolts.....	291, Brass Ring Handles.....	463, Hand Rail Brackets.....	55
37 1/2 x 37 1/2 x 38 1/2 x 38 1/2 38 1/2 x 37 1/2 38 1/2	72.00 72.50 73.00 73.50 74.00	No. 300, Square Cased Bolts.....	292, Brass Ring Handles.....	464, Hand Rail Brackets.....	55
38 1/2 x 38 1/2 x 39 1/2 x 39 1/2 39 1/2 x 38 1/2 39 1/2	74.00 74.50 75.00 75.50 76.00	No. 300, Square Cased Bolts.....	293, Brass Ring Handles.....	465, Hand Rail Brackets.....	55
39 1/2 x 39 1/2 x 40 1/2 x 40 1/2 40 1/2 x 39 1/2 40 1/2	76.00 76.50 77.00 77.50 78.00	No. 300, Square Cased Bolts.....	294, Brass Ring Handles.....	466, Hand Rail Brackets.....	55
40 1/2 x 40 1/2 x 41 1/2 x 41 1/2 41 1/2 x 40 1/2 41 1/2	78.00 78.50 79.00 79.50 80.00	No. 300, Square Cased Bolts.....	295, Brass Ring Handles.....	467, Hand Rail Brackets.....	55
41 1/2 x 41 1/2 x 42 1/2 x 42 1/2 42 1/2 x 41 1/2 42 1/2	80.00 80.50 81.00 81.50 82.00	No. 300, Square Cased Bolts.....	296, Brass Ring Handles.....	468, Hand Rail Brackets.....	55
42 1/2 x 42 1/2 x 43 1/2 x 43 1/2 43 1/2 x 42 1/2 43 1/2	82.00 82.50 83.00 83.50 84.00	No. 300, Square Cased Bolts.....	297, Brass Ring Handles.....	469, Hand Rail Brackets.....	55
43 1/2 x 43 1/2 x 44 1/2 x 44 1/2 44 1/2 x 43 1/2 44 1/2	84.00 84.50 85.00 85.50 86.00	No. 300, Square Cased Bolts.....	298, Brass Ring Handles.....	470, Hand Rail Brackets.....	55
44 1/2 x 44 1/2 x 45 1/2 x 45 1/2 45 1/2 x 44 1/2 45 1/2	86.00 86.50 87.00 87.50 88.00	No. 300, Square Cased Bolts.....	299, Brass Ring Handles.....	471, Hand Rail Brackets.....	55
45 1/2 x 45 1/2 x 46 1/2 x 46 1/2 46 1/2 x 45 1/2 46 1/2	88.00 88.50 89.00 89.50 90.00	No. 300, Square Cased Bolts.....	300, Brass Ring Handles.....	472, Hand Rail Brackets.....	55
46 1/2 x 46 1/2 x 47 1/2 x 47 1/2 47 1/2 x 46 1/2 47 1/2	90.00 90.50 91.00 91.50 92.00	No. 300, Square Cased Bolts.....	301, Brass Ring Handles.....	473, Hand Rail Brackets.....	55
47 1/2 x 47 1/2 x 48 1/2 x 48 1/2 48 1/2 x 47 1/2 48 1/2	92.00 92.50 93.00 93.50 94.00	No. 300, Square Cased Bolts.....	302, Brass Ring Handles.....	474, Hand Rail Brackets.....	55
48 1/2 x 48 1/2 x 49 1/2 x 49 1/2 49 1/2 x 48 1/2 49 1/2	94.00 94.50 95.00 95.50 96.00	No. 300, Square Cased Bolts.....	303, Brass Ring Handles.....	475, Hand Rail Brackets.....	55
49 1/2 x 49 1/2 x 50 1/2 x 50 1/2 50 1/2 x 49 1/2 50 1/2	96.00 96.50 97.00 97.50 98.00	No. 300, Square Cased Bolts.....	304, Brass Ring Handles.....	476, Hand Rail Brackets.....	55
50 1/2 x 50 1/2 x 51 1/2 x 51 1/2 51 1/2 x 50 1/2 51 1/2	98.00 98.50 99.00 99.50 100.00	No. 300, Square Cased Bolts.....	305, Brass Ring Handles.....	477, Hand Rail Brackets.....	55
51 1/2 x 51 1/2 x 52 1/2 x 52 1/2 52 1/2 x 51 1/2 52 1/2	100.00 100.50 101.00 101.50 102.00	No. 300, Square Cased Bolts.....	306, Brass Ring Handles.....	478, Hand Rail Brackets.....	55
52 1/2 x 52 1/2 x 53 1/2 x 53 1/2 53 1/2 x 52 1/2 53 1/2	102.00 102.50 103.00 103.50 104.00	No. 300, Square Cased Bolts.....	307, Brass Ring Handles.....	479, Hand Rail Brackets.....	55
53 1/2 x 53 1/2 x 54 1/2 x 54 1/2 54 1/2 x 53 1/2 54 1/2	104.00 104.50 105.00 105.50 106.00	No. 300, Square Cased Bolts.....	308, Brass Ring Handles.....	480, Hand Rail Brackets.....	55
54 1/2 x 54 1/2 x 55 1/2 x 55 1/2 55 1/2 x 54 1/2 55 1/2	106.00 106.50 107.00 107.50 108.00	No. 300, Square Cased Bolts.....	309, Brass Ring Handles.....	481, Hand Rail Brackets.....	55
55 1/2 x 55 1/2 x 56 1/2 x 56 1/2 56 1/2 x 55 1/2 56 1/2	108.00 108.50 109.00 109.50 110.00	No. 300, Square Cased Bolts.....	310, Brass Ring Handles.....	482, Hand Rail Brackets.....	55
56 1/2 x 56 1/2 x 57 1/2 x 57 1/2 57 1/2 x 56 1/2 57 1/2	110.00 110.50 111.00 111.50 112.00	No. 300, Square Cased Bolts.....	311, Brass Ring Handles.....	483, Hand Rail Brackets.....	55
57 1/2 x 57 1/2 x 58 1/2 x 58 1/2 58 1/2 x 57 1/2 58 1/2	112.00 112.50 113.00 113.50 114.00	No. 300, Square Cased Bolts.....	312, Brass Ring Handles.....	484, Hand Rail Brackets.....	55
58 1/2 x 58 1/2 x 59 1/2 x 59 1/2 59 1/2 x 58 1/2 59 1/2	114.00 114.50 115.00 115.50 116.00	No. 300, Square Cased Bolts.....	313, Brass Ring Handles.....	485, Hand Rail Brackets.....	55
59 1/2 x 59 1/2 x 60 1/2 x 60 1/2 60 1/2 x 59 1/2 60 1/2	116.00 116.50 117.00 117.50 118.00	No. 300, Square Cased Bolts.....	314, Brass Ring Handles.....	486, Hand Rail Brackets.....	55
60 1/2 x 60 1/2 x 61 1/2 x 61 1/2 61 1/2 x 60 1/2 61 1/2	118.00 118.50 119.00 119.50 120.00	No. 300, Square Cased Bolts.....	315, Brass Ring Handles.....	487, Hand Rail Brackets.....	55
61 1/2 x 61 1/2 x 62 1/2 x 62 1/2 62 1/2 x 61 1/2 62 1/2	120.00 120.50 121.00 121.50 122.00	No. 300, Square Cased Bolts.....	316, Brass Ring Handles.....	488, Hand Rail Brackets.....	55
62 1/2 x 62 1/2 x 63 1/2 x 63 1/2 63 1/2 x 62 1/2 63 1/2	122.00 122.50 123.00 123.50 124.00	No. 300, Square Cased Bolts.....	317, Brass Ring Handles.....	489, Hand Rail Brackets.....	55
63 1/2 x 63 1/2 x 64 1/2 x 64 1/2 64 1/2 x 63 1/2 64 1/2	124.00 124.50 125.00 125.50 126.00	No. 300, Square Cased Bolts.....	318, Brass Ring Handles.....	490, Hand Rail Brackets.....	55
64 1/2 x 64 1/2 x 65 1/2 x 65 1/2 65 1/2 x 64 1/2 65 1/2	126.00 126.50 127.00 127.50 128.00	No. 300, Square Cased Bolts.....	319, Brass Ring Handles.....	491, Hand Rail Brackets.....	55
65 1/2 x 65 1/2 x 66 1/2 x 66 1/2 66 1/2 x 65 1/2 66 1/2	128.00 128.50 129.00 129.50 130.00	No. 300, Square Cased Bolts.....	320, Brass Ring Handles.....	492, Hand Rail Brackets.....	55
66 1/2 x 66 1/2 x 67 1/2 x 67 1/2 67 1/2 x 66 1/2 67 1/2	130.00 130.50 131.00 131.50 132.00	No. 300, Square Cased Bolts.....	321, Brass Ring Handles.....	493, Hand Rail Brackets.....	55
67 1/2 x 67 1/2 x 68 1/2 x 68 1/2 68 1/2 x 67 1/2 68 1/2	132.00 132.50 133.00 133.50 134.00	No. 300, Square Cased Bolts.....	322, Brass Ring Handles.....	494, Hand Rail Brackets.....	55
68 1/2 x 68 1/2 x 69 1/2 x 69 1/2 69 1/2 x 68 1/2 69 1/2	134.00 134.50 135.00 135.50 136.00	No. 300, Square Cased Bolts.....	323, Brass Ring Handles.....	495, Hand Rail Brackets.....	55
69 1/2 x 69 1/2 x 70 1/2 x 70 1/2 70 1/2 x 69 1/2 70 1/2	136.00 136.50 137.00 137.50 138.00	No. 300, Square Cased Bolts.....	324, Brass Ring Handles.....	496, Hand Rail Brackets.....	55
70 1/2 x 70 1/2 x 71 1/2 x 71 1/2 71 1/2 x 70 1/2 71 1/2	138.00 138.50 139.00 139.50 140.00	No. 300, Square Cased Bolts.....	325, Brass Ring Handles.....	497, Hand Rail Brackets.....	55
71 1/2 x 71 1/2 x 72 1/2 x 72 1/2 72 1/2 x 71 1/2 72 1/2	140.00 140.50 141.00 141.50 142.00	No. 300, Square Cased Bolts.....	326, Brass Ring Handles.....	498, Hand Rail Brackets.....	55
72 1/2 x 72 1/2 x 73 1/2 x 73 1/2 73 1/2 x 72 1/2 73 1/2	142.00 142.50 143.00 143.50 144.00	No. 300, Square Cased Bolts.....	327, Brass Ring Handles.....	499, Hand Rail Brackets.....	55
73 1/2 x 73 1/2 x 74 1/2 x 74 1/2 74 1/2 x 73 1/2 74 1/2	144.00 144.50 145.00 145.50 146.00	No. 300, Square Cased Bolts.....	328, Brass Ring Handles.....	500, Hand Rail Brackets.....	55
74 1/2 x 74 1/2 x 75 1/2 x 75 1/2 75 1/2 x 74 1/2 75 1/2	146.00 146.50 147.00 147.50 148.00	No. 300, Square Cased Bolts.....	329, Brass Ring Handles.....	501, Hand Rail Brackets.....	55
75 1/2 x 75 1/2 x 76 1/2 x 76 1/2 76 1/2 x 75 1/2 76 1/2	148.00 148.50 149.00 149.50 150.00	No. 300, Square Cased Bolts.....	330, Brass Ring Handles.....	502, Hand Rail Brackets.....	55
76 1/2 x 76 1/2 x 77 1/2 x 77 1/2 77 1/2 x 76 1/2 77 1/2	150.00 150.50 151.00 151.50 152.00	No. 300, Square Cased Bolts.....	331, Brass Ring Handles.....	503, Hand Rail Brackets.....	55
77 1/2 x 77 1/2 x 78 1/2 x 78 1/2 78 1/2 x 77 1/2 78 1/2	152.00 152.50 153.00 153.50 154.00	No. 300, Square Cased Bolts.....	332, Brass Ring Handles.....	504, Hand Rail Brackets.....	55
78 1/2 x 78 1/2 x 79 1/2 x 79 1/2 79 1/2 x 78 1/2 79 1/2	154.00 154.50 155.00 155.50 156.00	No. 300, Square Cased Bolts.....	333, Brass Ring Handles.....	505, Hand Rail Brackets.....	55
79 1/2 x 79 1/2 x 80 1/2 x 80 1/2 80 1/2 x 79 1/2 80 1/2	156.00 156.50 157.00 157.50 158.00	No. 300, Square Cased Bolts.....	334, Brass Ring Handles.....	506, Hand Rail Brackets.....	55
80 1/2 x 80 1/2 x 81 1/2 x 81 1/2 81 1/2 x 80 1/2 81 1/2	158.00 158.50 159.00 159.50 160.00	No. 300, Square Cased Bolts.....	335, Brass Ring Handles.....	507, Hand Rail Brackets.....	55
81 1/2 x 8					







## MECHANICAL.

## Lost Energy.

Prof. R. H. Smith, in one of his articles in *London Engineering* on the above subject, to which we referred a few weeks ago, considers the question of bearings, frames and foundations. This, he says, is really the most important part of the whole subject, and, unfortunately, it is so complex that mathematical treatment, even with a rough approximation to accuracy, is impossible. Under this heading come all the vibrational losses that occur through wall brackets, counter-shaft hangers, &c. During each revolution of an engine the cover at each end of the cylinder springs back a certain distance, dependent on its own rigidity as a plate and on that of its mode of connection to the bed-plate. The work done thus is probably nearly all lost, because, although the covers spring back with nearly perfect elasticity, they do not do so at a time when such recovery can help usefully in driving the engine. The same may be said of the springing of the guide-bar, which is bent twice per revolution. The brasses in the crank-shaft pedestal are subjected to a bearing pressure which not only varies in amount, but which—so far, at any rate, as concerns that component of it produced by the working of the engine exclusive of the constant weight of shaft, fly-wheel, &c.—changes in direction so far as to be absolutely reversed twice per revolution. The work lost in stressing and straining the brasses, pedestal and its supports in each periodic variation of pressure equals the average force multiplied by the displacement of the surface of the brass. This displacement does not only or chiefly depend on the size and elasticity of the brasses. It depends much more on the design of the pedestal that supports them, and, again, on what comes behind the pedestal to support it.

The strain energy created is not put into the brasses only, but all their supports also have strain energy periodically stored up in them. For example, the opposing thrusts of the steam on the cylinder cover, and of the crank-shaft on the pedestal, rack the whole base-plate, bending it convex upward on, say, the outstroke, and downward on the instroke, and the strain energy produced during each stroke is distributed really through almost the whole volume of metal in the whole frame. If the engine and the machine it drives be all "self-contained" in one frame, then if the whole be skillfully arranged it is possible to prevent this conversion of energy, that might otherwise do useful work, into waste strain energy from spreading beyond the frame on which the whole is mounted. But the connection between the frame of the driving engine and of the machinery it drives is in the vast majority of cases only established through the surface of the earth and the walls of the building. In this ordinary case the waste strain energy caused by the pulsation of the effort spreads far beyond the limits of the frame proper of the machinery. In other words, the periodic displacement or "give" of the surface of the bearing depends, not only on the build of the machine, but on the manner of its setting, the character of the foundation on which it is set, and even on the nature of the surrounding portions of the ground and buildings. A wall bracket vibrates with the varying effort of the shaft it carries through an amplitude dependent in large measure upon the rigidity of the wall carrying the bracket, and the rigidity and stability of this wall depends upon its connections with the rest of the building and with the earth. A striking illustration of the truth of the far reaching range of the strain waves of energy lost from an engine must be within the observation of many engineers—namely, the case of an engine which appears to be more noisy in a distant overhead part of the building than in the engine-room itself. The walls in the engine-room, where they are close to their foundations, vibrate through very small amplitudes and create little noise, but the vibratory energy, being transmitted upward to where the walls are free to sway through greater amplitudes, creates at these higher parts a louder noise. Now, all this sound represents so much waste energy lost from the engine, and it is evident that if these upper, more freely vibrating, parts of the walls were not there there would be less passage, so to speak, less facility for the discharge of waste energy, and therefore less energy wasted. All these surroundings form so many conductors of waste energy away from the machinery, and the waste flow of energy will be greater or less according as the sum of conductivities or resistances offered by these various passages of escape be great or small.

It is to be observed that by far the greater portion of the energy so driven in at the bearing surfaces is lost—is hopelessly irrecoverable. It is transmitted away in slow or rapid waves. No doubt these waves are partly reflected at many different surfaces, but it is a hundred to one that they will be reflected in the wrong direction to be capable of being restored to the working energy of the engine, and even if by any remote chance a portion were reflected in a favorable direction it is almost certain that it will not be reflected at such an exact time as to reach again the bearing surface at such a period that it will help, and not hinder, the useful work of the engine.

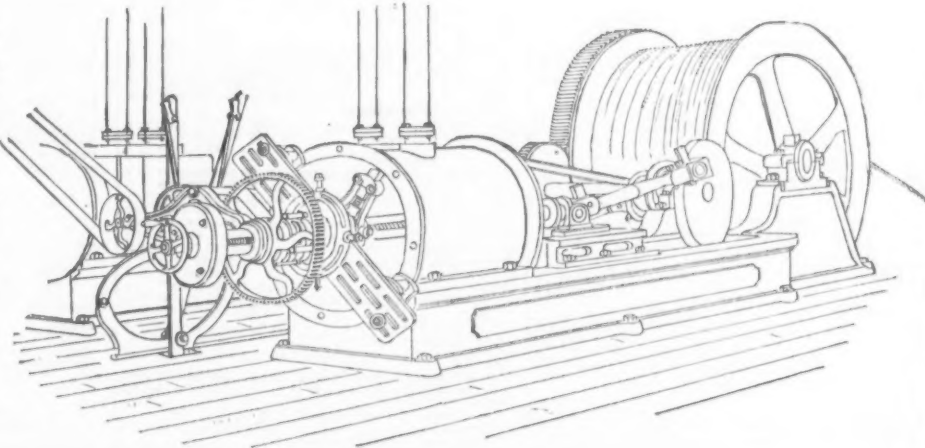
## A Monster Crane.

The most powerful steam crane possessed by any dock company in England has been completed at the Alexandra Dock, Hull, and satisfactorily tested with a load of 103 tons. It raised a load of 65 tons at the rate of 6 feet 6 inches per minute, and made a complete revolution, the load passing through a distance of 383 feet in 6 minutes 50 seconds. The Alexandra Dock is now fitted for the reception of the largest vessels, and will no

doubt be largely used by the naval authorities. All the valves and levers connected with the crane are within easy reach of one attendant. Messrs. James Taylor & Co., Britannia Works, Birkenhead, are the builders.

## Portable Cylinder Boring Machine.

The annexed cut shows a portable cylinder boring machine, built by Pedrick & Ayer, 1025 Hamilton street, Philadelphia, adapted to the boring in their present positions of all makes and sizes of mining engines. It is necessary only to take off the cylinder-head and remove the piston, when the cylinder can be accurately bored in a very short time. This saves breaking the steam joints, bolts, sets, and much time, money and annoyance, as very often the cylinder can be rebored in less time than it would take to

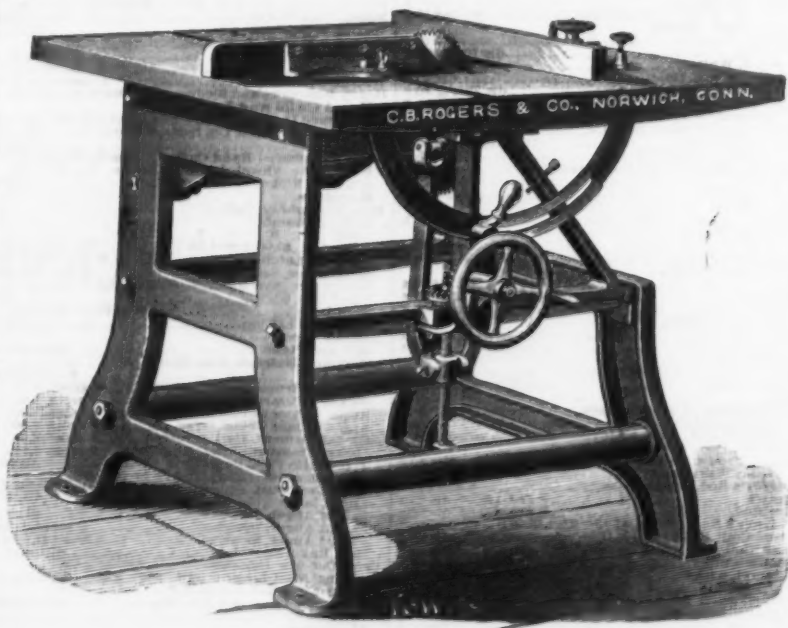


Portable Cylinder Boring Machine, Built by Pedrick & Ayer, Philadelphia, Pa.

remove the cylinder from its bed. Messrs. Pedrick & Ayer have built and used for years these portable machines for boring all makes and sizes of steam-engine cylinders, pumps, steam hammers, blowing engines, air compressors, mining and hoisting engines, Corliss valves, hydraulic and steam hoists, heavy housings, large wheels, &c. They will bore in any position, horizontal, vertical or inclined on the engine bed or on the ground. They are built with powerful geared driving-power, supplied with two or more changes as desired. This machine was recently used in reboring a 90-inch cylinder on the steamship Indiana, of the American Line. We have before us a large number of flattering testimonials from different establishments where the machine has been in use.

## Combination Miter Cut-Off and Splitting Saw.

C. B. Rogers & Co., of Norwich, Conn., are putting on the market a combination miter cut-off saw with tilting top, which is illustrated in the annexed cut. They



Combination Miter Cut-Off and Splitting Saw.—Built by C. B. Rogers & Co., Norwich, Conn.

claim that it is one of the handiest and most useful tools on the market. It is made throughout of steel and iron and is put together in the most thorough manner. The table, which is planed true, measures 3 by 3 feet 3 inches, and is arranged to tip to any angle up to 45°. It is also provided with a splitting-gauge and two cut-off gauges for common or miter work. The saw arbor is adapted to a yoke that swings on a shaft at the back of the machine and is raised and lowered by means of a screw and hand-wheel, situated so as to be convenient to the hand of the operator. The tilting device is also conveniently arranged, and all necessary adjustments are made from the front of the machine. The table is calculated to carry 14 inch saws. The diameter of the saw mandrel is 1 inch. A counter-shaft, with 14-inch hangers, is used with the machine, and in mounting is placed 5 feet from the center of the saw arbor. The weight of the machine is about 825 pounds, and 2 to 3 horsepower are required to drive it.

## Safety-Valves.

The Acting Secretary of the Treasury has approved of the following circular, which was addressed on the 25th ult. to special inspectors of foreign steam vessels:

You are hereby notified that Rule 18 of the Rules and Regulations, page 13, Form 2180, is hereby amended by adding thereto the following clause from Section 24, Rule II of the Rules and Regulations of the Board of Supervising Inspectors, namely:

"Any spring-loaded safety-valve constructed so as to give an increased lift by

the operation of steam after being raised from their seats, or any spring-loaded safety-valve constructed in any other manner so as to give an effective area equal to that of the aforementioned spring-loaded safety-valve, may be used in lieu of the common lever-weighted valve on all boilers on steam vessels, and all such spring-loaded safety-valves shall be required to have an area of not less than 1 square inch to 3 square feet of grate surface of the boiler, and each spring-loaded valve shall be supplied with a lever that will raise the valve from its seat a distance of not less than that equal to one-eighth the diameter of the valve opening."

## Water Pumping.

The question is quite often put, What size of pump and what horse-power are required

to raise a certain amount of water in a certain time? Answering this, the *American Engineer* says:

A gallon of water weighs 10 pounds; hence if it be desired to raise 1000 gallons per hour to a height of 100 feet the load to be raised would be 10,000 pounds 100 feet high. This 10,000 pounds raised 100 feet high is equal to raising 1,000,000 pounds 1 foot high. Dividing the 1,000,000 pounds by 60 we have 16,666⅔ pounds to be raised in one minute. A horse-power is represented by 33,000 pounds raised 1 foot high per minute; hence the horse-power required to raise the 16,666⅔ pounds 1 foot in one minute would be ascertained by dividing 16,666⅔ by 33,000. This gives 0.505 horse-power, or a little over ½ horse-power. To overcome any contingencies, friction, &c., these small powers are generally doubled; for larger powers a percentage of 60 to 70 is added. In the case mentioned the power required to assure the delivery of 1000 gallons at a height of 100 feet in one hour would be 1 horse-power. To develop a formula we may represent the number of gallons to be raised in one

minute by  $G$  and the height by  $h$ , when the horse-power required would be represented by  $\frac{G \times 10 \times h}{33,000}$ . If the amount required be expressed in cubic feet instead of gallons the formula would be  $\frac{6\frac{1}{4} G \times 10 \times h}{33,000}$ , there being 6¼ gallons to the cubic foot, and 10 pounds to the gallon of water, or 62.5 pounds to the cubic foot.

To find the size of pumps required, let  $D$  represent the diameter of pumps in inches;  $S$ , the number of strokes per minute;  $L$ , the length of stroke of pump in feet;  $F$ , the cubic feet delivered per minute;  $G$ , the number of gallons delivered per minute. Then  $F = \frac{D^2 \times 0.7854 \times L \times N}{144}$   $\times L \times N = 0.00545 D^2 L N$  (1)

$D = \sqrt{\frac{F}{0.00545 L N}}$  (2)

$G = 6.25 F = 6.25 \times 0.00545 D^2 L N$  (3)

$G = 0.034 D^2 L N$  (4)

$D = \sqrt{\frac{G}{0.034 L N}}$  (5)

Seventy brewers of this city have joined in a protest against the boycott which the unions have pronounced upon George Ehret for testifying under oath on the trial of the men accused of extorting money from Mr. Theis.

## MANUFACTURING.

## Iron and Steel.

The furnaces of the Brier Hill Iron and Coal Company, at Youngstown, Ohio, are all in blast, and are producing at present about 10,000 tons of iron per month.

The Sharon Iron Company, at Sharon, Pa., will shortly commence the erection of a large Bessemer steel plant on ground adjoining their present works. Plans and specifications for the new industry have been drawn up and submitted to the company for approval. The new mill will have a capacity of about 150 tons per day, and will cost in the neighborhood of \$100,000.

The Mahoning Valley Iron Company, at Youngstown, Ohio, signed the Amalgamated scale on the 7th inst., and resumed operations in full in all departments on Monday last.

Shoenberger & Co., at Pittsburgh, resumed operations in their nail factory on the 7th inst. About 150 nailers and 200 nail feeders went to work.

Extensive improvements are being made at the mills of the Falcon Iron and Nail Company, of Niles, Ohio. Five of the puddling furnaces are being torn down and will be rebuilt, including new stacks. New squeezers are being placed in the muck mill, and other improvements are also being made. The nail factory of the above company resumed operations on Monday, the 12th inst.

The introduction of natural gas as a fuel into the mills of Oliver Bros. & Phillips, at Pittsburgh, has done away with the consumption of 20,000 bushels of coal per day.

The Sterling Steel Company, at Demmer, near Pittsburgh, will close down on the 23d inst. for the erection of a new crucible steel furnace of 24 pots. During the stoppage natural gas will be introduced into the works.

The nail factory of Brown, Bonnell & Co., at Youngstown, Ohio, which has been idle for 13 months past, resumed operations this week.

Among the mills at Pittsburgh which have closed down for repairs and stock-taking are the Pittsburgh Forge and Iron Works, the three mills of Oliver Bros. & Phillips, Elba Iron and Bolt Works, Keystone Rolling Mill Company, Anderson, DuPuy & Co.'s steel works and the Star Iron Works of Lindsay & McCutcheon, of Allegheny City. A number of extensive repairs are being made by the latter firm. The roof and the frame of the new puddling department, which was destroyed by fire nearly two months ago, is to be rebuilt of iron, which will require more than a month.

J. P. Witherow, of Pittsburgh, has just closed a contract with the Bellefonte Iron Works, of Bellefonte, for the erection of a large modern blast furnace to be built at once. The capacity will be about 100 tons a day of hematite iron, and either Connellsville or Snowshoe coke will be used.

The blast-furnace employees at Pittsburgh, who have now all become Knights of Labor, are moving for a 20 per cent. advance of wages, and their demands have already been presented to Carnegie, Phipps & Co., of the Lucy Furnaces, and to the Isabella Furnace Company. These two companies have offered to submit the question to arbitration. It is said that the same demand will be made by the Edgar Thomson furnacemen, but the managers claim that it would be unfair, as the scale signed on January 1 runs for a year.

It is said that an effort to raise \$25,000 in the town of Toronto, near Steubenville, Ohio, for the purpose of erecting a nail mill is being made. The gentlemen who ask the citizens to do this are not residents of the place, but agree to furnish the remainder of the capital and put up the mill.

Messrs. Boyle & Bissell, of Pittsburgh, agents for Gordon, Strobel & Laureau, of Philadelphia, inform us that they have just closed a contract with the Belleville Nail Company, of Belleville, Ill., for a complete Bessemer steel plant to consist of two 3-ton converters, with all engines, cranes, pumps, buildings, and, in fact, everything appertaining to the plant. It will have a capacity of 200 tons per day, and work on it will be commenced at once. They have also contracted with the Jefferson Iron Works, of Steubenville, Ohio, for a complete Bessemer plant. It will consist of two 3-ton converters, and will be identical with the Belleville plant. But one of these converters will be built at present, the other one to be added as soon as the business requires the extra product.

The Top Mill Furnace, Wheeling, was banked on the 3d inst. for repairs to the hot blast.

There is a strike at the mills of Everson & Co., at Scottdale, Pa.

Vigo Furnace, Indiana, will probably go out of blast in about a week.

The second stack at South Pittsburgh, Tenn., has blown in.

The Lowmoor Iron Co., Lowmoor, Va., have decided to put up a second furnace.

The Bloomsburg Iron Company, of Bloomsburg, Pa., recently blew out their No. 2 Furnace, which had been 6½ years in continuous blast.

According to the *Bulletin*, the Puget Sound Iron Company, of Irondale, Washington Territory, deny the report that they contemplate the abandonment of manufacturing operations. On the contrary, they are preparing to blow in their furnace, and propose also to erect a steel plant in connection with their works. The intention is to manufacture sheet steel. The Texada ore which this company uses is reported by chemists to be specially suitable for the manufacture of Bessemer steel.

At the adjourned annual meeting of the Oregon Iron and Steel Company, held on July 1, the following directors were elected: W. S. Ladd, Elijah Smith, C. J. Smith, S. G. Reed and L. B. Seeley. The directors

elected the following officers: Elijah Smith, president; W. S. Ladd, vice-president; William M. Ladd, secretary.

The Pittsburgh Steel Casting Company, of Pittsburgh, will build a 7500-ton hydraulic press.

The York Iron Company, of Minneapolis, Minn., have completed the erection of a charcoal blast furnace at Black River Falls, Wis., and will blow it in about the 15th inst. The dimensions of the furnace are 55 x 11 feet; it is equipped with two Whitwell hot-blast stoves, each 60 x 16 feet; it has a closed top; it will be operated on local red hematite and magnetic ores, and its estimated annual capacity is 16,000 net tons of pig iron. The furnace has been named Minneapolis Furnace. The officers of the company are as follows: Samuel C. Gale, president; James E. York, vice-president; J. Hyde Monroe, secretary; Otis A. Pray, treasurer. Horace E. Burt is manager at Black River Falls.

A number of men employed by the great tube works at McKeesport have organized a lodge of the Amalgamated Association in spite of an agreement made some years ago to work independently of it, under which agreement they secured steady and remunerative employment.

The Calumet Iron and Steel Company, at Cummings, Ill., are making preparations to start up their guide mill and steel department. All other departments are running satisfactorily, and the company have a good demand for their product.

## Machinery.

Señor M. Carcuera, of the City of Mexico, was in Pittsburgh last week, and placed an order with McIntosh, Hemphill & Co., of that city, for a lot of machinery.

The firm of Nuttall Brothers, Allegheny, Pa., have undertaken the difficult task of making a perforated steel plunger 9½ feet long for the hydraulic press used by the Standard Underground Cable Company in their operations at Sixteenth and Railroad streets. This plunger is to be made from a solid bar of hammered steel prepared by the Crescent Steel Company, Pittsburgh. It is to be 2½ inches outside measurement, and the bore the entire length is to be 1½ inches, to be bored from each end, the drills to meet without shoulder at the center. This is the second plunger of this length made by this shop, besides a shorter one of 6½ feet.

The Standard Tool Company, of Cleveland, Ohio, have been assigned a patent for an important twist-drill grinding machine. It is the invention of S. Y. Ryder, of that city.

The improvements in the machinery at the Corliss Engine Works, Providence, R. I., are still in progress, and it will be into the early autumn before the shop will be equipped as Mr. Wm. Corliss plans. Meantime they have only three engines in hand—one for the new Lansdale Mill, one for the Globe Woolen Mill and one for John Wamamaker, Philadelphia. They have refused a large amount of work, preferring not to have the reorganization of the plant interfered with.

The Lima Machine Works, Lima, Ohio, report a rush of orders.

Cramp & Son, Philadelphia, are building a new iron ferry-boat 207 feet long, with engine 50 inches diameter, 10 feet stroke; a new steamer for the Morgan Line; repairing the English steamer Eros, which went ashore last April, the repairs estimated to cost \$50,000. The collier Hercules is undergoing a thorough overhauling on the railway. They are also building three new steamers for the Southern Pacific and Wm. P. Clyde & Co.

The Morris Machine Works, of Baldwinville, N. Y., report that, besides selling six 15 x 16 inch engines and a number of smaller ones last month, 15 boilers were disposed of, and also 40 of their centrifugal pumps. July opens well, as they already have orders for 12 engines. The prospects are encouraging.

Geo. J. Fritz, of the Central Iron Works, St. Louis, Mo., has added to his plant a 600-pound Morgan & Williams steam hammer.

G. R. Gale, 66-70 River street, Cleveland, Ohio, has begun the manufacture of a planer of new design which will plane 30 inches wide, 30 inches high and 8 feet long.

The Crane Iron Company, at Catawauqua, Pa., are fitting No. 5 Furnace with one of the improved Crane Brothers' steam hoists, similar to Nos. 1 and 3. The hoist removed was propelled by water, and throughout the winter the platforms were made dangerous with ice. The new arrangement is very much superior, and experience with two in use for several years determined the adoption at all the furnaces.

The Cordesman Machine Company, of Cincinnati, Ohio, are turning out an improved band-saw machine, principally designed for heavy work, such as car and ship building. It will take in saws measuring from ¼ inch to 3 inches in width.

A lot of machinery to go to Almeria, Spain, has been finished at the Jeansville Iron Works, near Weatherly, Pa. It consists of gravity plane drums, shears, safety cars, break-wheels, &c. It is to be used at the iron mines of William D. Marvel & Co., who ship the Almeria ore to England and the United States. The ore is found on a mountain and has to pass down a plane 3300 feet high to a railroad which conveys it to a port on the Mediterranean, 10 miles distant. The machinery is modeled after the Buck Mountain coal planes, but a good deal stronger.

The New York Safety Steam Power Company, through their Chicago branch, have lately furnished the World's Pastime Exhibition Company, at Cheltenham Beach, Ill., with one 50 and two 80 horse power engines, and also one 25 horse power to Sea Breeze, N. Y.

## Miscellaneous.

The Mahoning Gas Fuel Company, of Youngstown, Ohio, have been organized by C. H. Andrews and other capitalists, with a capital of \$300,000 and a charter secured at

(Concluded on page 29.)







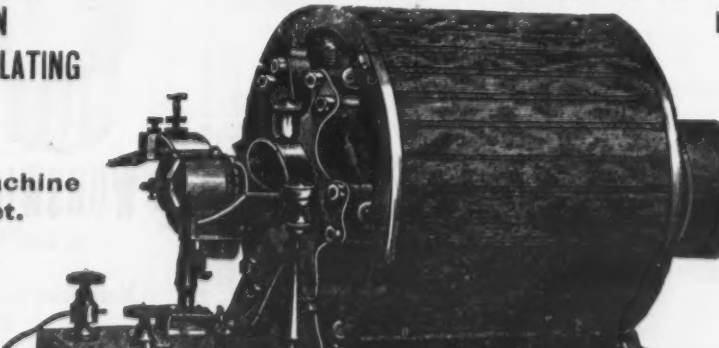
# Nickel-Plating and Polishing Materials.

SOLE MANUFACTURERS OF

THE AMERICAN  
DYNAMO ELECTRO-PLATING  
MACHINE.

Best Plating Machine  
in the Market.

HEADQUARTERS FOR  
EVERYTHING  
IN THE PLATING AND  
POLISHING LINE.



Established 1863. Incorporated 1881.

THE  
Largest Manufacturers  
IN THE WORLD OF

Nickel Anodes,  
Nickel Salts,  
Patent Muslin Buffs,  
Polishing Lathes,  
Polishing Felt,  
Polishing Rouges,  
Pol'ng Compositions,  
Walrus Leather,  
Wood Emery Wheels,  
Platers' Brushes,  
&c., &c., &c.

WORKS: OFFICES:

**Zucker & Levett Chemical Co.,** 538 to 564 W. 16th St., 36 to 40 11th Ave., NEW YORK, U. S. A.



# WHOLESALE METAL PRICES, July 14, 1886.

## METALS.

**IRON.**—Duty: Bars, 8-10¢ to 11-10¢; provided that no bar iron shall pay a less rate of duty than 35¢. Sheet, 11-10¢ to 15-10¢. Band, Hoop and Scrolled, 1¢ to 1 1/4-10¢. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 1¢.

### Standard American Pig Iron.

Foundry No. 1 X..... 17.00 @ 18.50  
Foundry No. 2 X..... 17.00 @ 17.50  
Gray Forge..... 16.00 @ 16.50

### No. 1 Scotch Pig Iron.

Cambrow..... 18.50 @ 19.00  
Coltman..... 18.50 @ 19.00  
Shotta..... 18.50 @ 19.00  
Hengarnock..... 18.50 @ 19.00  
Langdon..... 18.50 @ 19.00  
Sumner..... 18.50 @ 19.00  
Dumellington..... 18.50 @ 19.00  
Eglinton..... 18.50 @ 19.00  
Clyde..... 18.50 @ 19.00

Steel at Eastern mills..... 18.50 @ 19.00  
Old Rails, T..... 18.50 @ 19.00

Wrought, 1/2 ton, from yard..... 18.50 @ 19.00

**Bar Iron from Store.**  
Common Iron:  
1/2 to 1 in. round and square..... 1.75 @ 1.80

Refined Iron:  
1/2 to 1 in. round and square..... 1.75 @ 1.80

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## LEAD.

Duty: Pig, 2¢ 100 lb.; Old Lead, 2¢ 100 lb.; Pipe and Sheet, 2¢ 100 lb.

Pig..... 4.00 @ 5.25

Bar..... 4.00 @ 5.25

Pipe..... 4.00 @ 5.25

Block Tin Pipe..... 4.00 @ 5.25

Tin Lined Pipe..... 4.00 @ 5.25

Sheet..... 4.00 @ 5.25

Shot, 1/2 bag, 25 lb..... 4.00 @ 5.25

Chilled Shot, 1/2 bag, 25 lb..... 4.00 @ 5.25

Drop, 1/2 bag, 25 lb..... 4.00 @ 5.25

Huck, 1/2 bag, 25 lb..... 4.00 @ 5.25

Chilled Shot, 1/2 bag, 25 lb..... 4.00 @ 5.25

Drop, 1/2 bag, 25 lb..... 4.00 @ 5.25

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Drop, 1/2 bag, 25 lb..... 4.00 @ 5.25

Huck, 1/2 bag, 25 lb..... 4.00 @ 5.25

Chilled Shot, 1/2 bag, 25 lb..... 4.00 @ 5.25

## Black Paint, in oil..... kegs, 4¢; assorted cans, 11¢

Blue, Prussian, fair to best..... 40 @ 55¢

Chinese dry..... 40 @ 55¢

Ultramarine..... 15 @ 30¢

Brown, Spanish..... 10 @ 15¢

Van Dyke..... 10 @ 15¢

Dryers, Patent American..... 10 @ 15¢

Green Chrome..... 10 @ 15¢

Paris..... 10 @ 15¢

Iron Paint, Bright Red..... 10 @ 15¢

Purple..... 10 @ 15¢

Ground in oil, Bright Red..... 10 @ 15¢

Red..... 10 @ 15¢

Brown..... 10 @ 15¢

Purple..... 10 @ 15¢

White Lead, American, pure dry..... 10 @ 15¢

White Lead, English Prime..... 10 @ 15¢

Yellow Ochre, French..... 10 @ 15¢

Yellow Chrome..... 10 @ 15¢

Zinc White, American No. 1, dry..... 10 @ 15¢

French (Paris Dry)..... 10 @ 15¢

White Lead, American, pure dry..... 10 @ 15¢

White Lead, English Prime..... 10 @ 15¢

Yellow Ochre, French..... 10 @ 15¢

Yellow Chrome..... 10 @ 15¢

Zinc White, American No. 1, dry..... 10 @ 15¢

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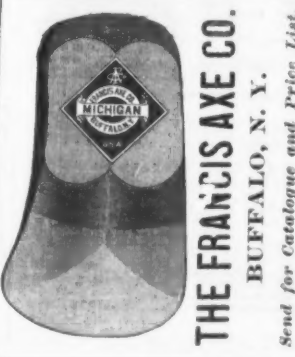
French (Paris Dry)..... 10 @ 15¢

White Lead, American, pure dry..... 10 @ 15¢

White Lead, English Prime..... 10 @ 15¢

Yellow Ochre, French..... 10 @ 15¢

Yellow Chrome..... 10 @ 15¢



## ATOMIZER AND SPRINKLER.

(Goldman's Patent.)

FOR FLOWERS, CLOTHES, CARPETS, FLOORS, HOUSE PLANTS AND VARIOUS FINE SPRINKLING. THROWS A UNIFORM SPRAY A SPRINKLER FOR A THOUSAND AND ONE USES.

Just the thing to sell by the Hardware, Agricultural, House Furnishing and Seedmen's Trade.

\$2.50 PER DOZEN.

An Atomizer for sprinkling your carpets to settle the dust previous to sweeping. Unequaled for house plants and flowers. For destroying insects on plants, use a few drops of ammonia in the water. The liquid can be thrown on the under side of the leaves and into the flowers. A shower bath for the baby or lap dog. Excellent for sprinkling clothes; no housekeeper or laundry should be without one; you will not go back to sprinkling by dipping your hand in water; your clothes will not get wet in one place and remain dry in another. Tobaccoists and cigar makers, the finest Atomizer for sprinkling your tobacco. For disinfecting purposes, to be used in hospitals, sick rooms, on walls, floors, clothes, &c. For cleaning wounds in man or beast. This Atomizer sells upon its own merits. Fifty thousand sold in New Orleans during the Exposition.

THE ALFORD & BERKELE CO., SOLE AGENTS, P. O. Box 2002. 77 Chambers St., New York.

## THE JENNINGS & GRIFFIN MFG. CO., Sole Proprietors of the

L'Hommiedieu Auger Works. The Oldest Auger Works in America. Established by Joshua L'Hommiedieu in 1818.

MANUFACTURERS OF "L'Hommiedieu" Ship Augers and Ship Auger Bits. Ship Auger Pattern Car Bits. Single Twist Boring Machine Augers. TRACY'S TREMAY AND SCOTCH PATTERN AUGERS.



These Augers and Bits are designed especially for boring hard wood. Special sizes of Machine Augers and Bits. Turned Shank, Ship Auger Pattern, furnished promptly to order. N. B.—An inferior Ship Auger is now sold on the market under the impression that they are made by experienced mechanics. We would say that we have at our L'HOMMIEDEU & WATKINS shops the only experienced Ship Auger makers in the United States. We not only have the skilled labor but the best equipped shop for manufacturing this class of goods in the world. Our forging room is entirely new, with new drop, new trip-hammer and every facility in the way of lab-saving tools that can be devised. The "L'HOMMIEDEU" name has been before the public for more than 65 years. Goods bearing the trade-mark of L'HOMMIEDEU or WATKINS are fully warranted.

C. E. JENNINGS & CO., 69 Heade and 87 Chambers Sts.

## THE WILMOT & HOBBS MFG. CO.,

Gold Rolled Iron and Steel, For Blanking, Stamping, Cupping and Drawing.

BRIDGEPORT, - - - - - CONN.

## S. CHENEY & SON, MANLIUS N. Y.



(Concluded from page 25.)

Columbus. The company will lay pipe from the Sheffield (Pa.) district, conveying natural gas to Youngstown and other points through the Mahoning Valley. The distance from Youngstown to Sheffield is about 40 miles.

The glass works at Bellaire, Ohio, are all introducing natural gas.

Of the 10,832 ovens in the Connellsville coke region there were but 569 idle last week, classified as follows: Pool ovens, 92; furnace ovens, 350; old ovens, 127.

The use of natural gas in Pittsburgh industries has cut down the consumption of coal at least 37,000,000 bushels per year, and thrown about 5000 miners out of work.

The Pittsburgh Brass Company, who are established in the old Eagle cotton-mill building in Allegheny City, inform us that they are running to their full capacity and disposing of their goods as fast as made.

The American Aluminium Company have been organized at Detroit, Mich., with a capital stock of \$2,500,000, the machinery being valued at \$3000, and the patents of Dr. Smith for the United States, Great Britain and France for a process for the manufacture of aluminium at \$2,497,000. The stock is divided into 200,000 shares of \$25 each. Messrs. John W. Smith, Pontiac; Fredrick J. Seymour, Findlay, Ohio; Wm. L. Webber, East Saginaw; Sanford Keeler, East Saginaw; Harry A. Conant, Monroe, and C. Stuart Draper, of Pontiac, constitute the Board of Directors.

The following table from the *Marquette* (Mich.) *Mining Journal* exhibits in gross tons the total lake shipments of iron ore from the mines of the Marquette and Menominee ranges for the current season up to and including Wednesday, the 7th., together with the shipments from the same ports for the corresponding period of last year:

Name of port.	1885.	1886.
Marquette.....	303,054	308,759
Escanaba.....	518,959	435,016
L'Anse.....	14,000	14,000
St. Ignace.....	18,956	29,388
Total.....	845,969	787,162

This shows a gain of 138,777 gross tons in this season's shipments up to date. The gain from the other Lake Superior districts will increase this figure to about 300,000 tons.

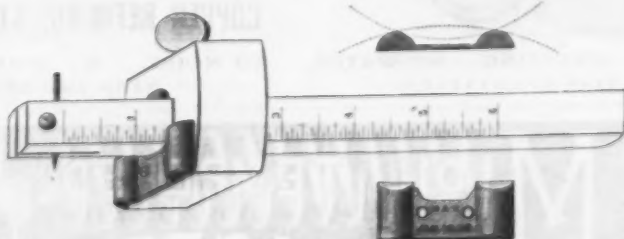
The Laclede Fire Brick Mfg. Company, of St. Louis, have been favored with the contract of the United Coal and Oil Gas Company, of Chicago, for all the manufactured clay needed in the construction of the latter's new plant. About 135 tons will be required.

Extensive improvements are being made in the fire-brick works of Welch, Glomier & Co., located at Phillipsburgh, Pa. The firm now employ from 25 to 30 hands and turn out daily from 12,000 to 15,000 brick, tile, &c., of all kinds. The improvements which are being made now will render the employment of some 10 to 15 additional hands necessary, and will increase the products of the works to 30,000 bricks daily.

## Hardware Novelties.

### Improved Carpenters' Gauges.

In the very common use made of a marking-gauge by wood-workers and in the simple construction of its parts may perhaps be found cause for the notable lack there has been in improvements on this tool. We illustrate herewith one improvement which considerably enlarges the scope of the ordinary marking gauge by enabling the owner to run a gauge line with perfect steadiness and accuracy around curves of any degree, and either concave or convex. A metallic face-plate with two ribs or projections is secured to one side of the gauge-head, and when this side of the head is in use the two ribs will both have a bearing on the edge of the work in hand, and, being circular in their form, the ribs will adapt themselves to any curve, even down to that of a 3-inch circle. For ordinary straight lines the gauge-head may be turned around on the bar, though this is not necessary, as the two ribs on the face-plate are both of the same size and present a parallel bearing for all straight work. Other improvements in gauges, as shown in the illustration, are the insertion of a brass shoe under the thumb-screw, thus protecting the gauge-bar from being dented by the action of the screw, and the substituting of a tempered-steel point which can be moved down as it wears, or can be easily removed and replaced for sharpening or for repairs. These improvements have been made by the Stanley Rule and Level Co., of New Britain,



Improvement in Carpenters' Gauges.

Conn., and are attached to their line of gauges, which are sold by hardware dealers generally.

### The Emerson Door Hanger.

In Fig. 1 we show a new form of door hanger which is being introduced to the trade by Emerson, Baldwin & Co., Syracuse, N. Y. By inspection of the engraving it will be seen that the hanger is anti-friction in its features. A number of pulleys or wheels are employed which run over a rail having a tongue or head through its center. The pulleys are double or grooved. The space between them corresponds to the

thickness of the tongue on the rail which we have mentioned. The door is hung to a second rail which rides on the pulleys or wheels at the top. The tongue, which in

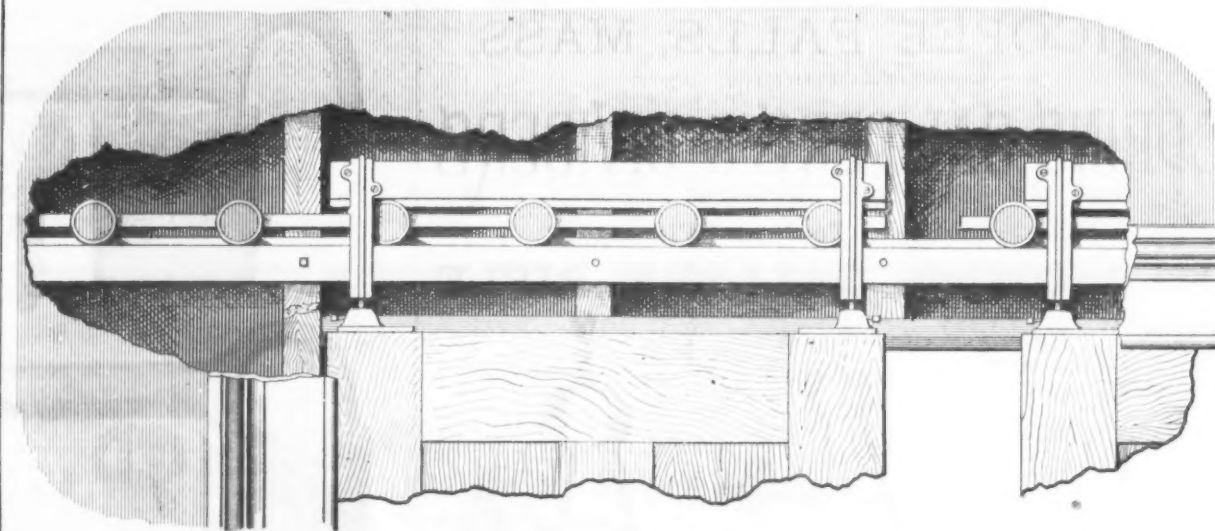


Fig. 1.—The Emerson Door Hanger.—Emerson, Baldwin & Co., Syracuse, N. Y.

this case projects downwardly between the two surfaces, is shown in the sectional view. The pulleys or wheels are yoked together by a narrow strip of wood which is notched so as to set over the axes and keep them in



Fig. 2.—Vertical Section Through Emerson Hanger.

proper relationship to each other. The entire construction is such as to reduce friction to a minimum. Among the advantages claimed for this construction, the features of which are clearly shown in Figs. 1 and 2

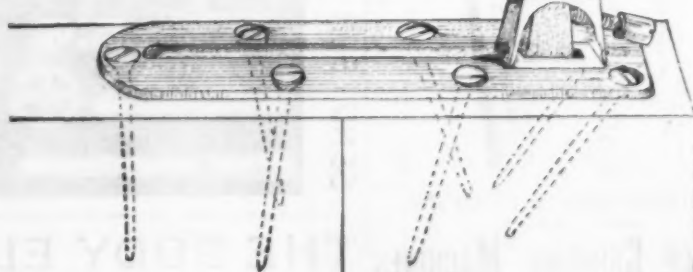


Fig. 3.—Adjuster Used with the Emerson Hanger.

of the engravings, are that the doors are easily detachable and can be taken off in a moment without removing a screw and without taking off the casing. This is accomplished by simply lifting the door up a very

side, as shown in the cut. The construction is such as reduces noise to a minimum. The doors hung by this device are capable of fine adjustments by means of the adjuster shown

in Fig. 3. This has the advantage of simplicity of parts, and is easy of attachment. It is fastened by screws put in on a slant. The makers of this hanger inform us that it has been selected for use in the Garfield Monument now in process of erection in Cleveland.

## THE WEEK.

An injunction against the manufacture of naphtha gas was granted by Judge Cullen, in the Orange County Circuit Court, last week, on account of the alleged injury to health and property caused by noxious fumes.

An invention which, it is claimed by gas engineers, will revolutionize the present system of gas lighting has just been perfected by Dr. Auer in the chemical laboratory of the Vienna University. Briefly described, the invention may be said to consist in rendering a cotton wick incombustible by impregnating it with a metallic liquid. Thus treated the wick, instead of burning, merely glows, emitting a radiance not unlike that of the electric light. The whole process is very simple, and the great advantage of the invention is that it may be applied to any gas burner.

The final experiments with Zalinski's dynamite gun will be made this week with several charges of 100 pounds each. Meanwhile the company that made the gun are manufacturing a new arm, larger, longer and heavier, with a caliber of 10½ inches, capable of dropping 200 pounds of dynamite upon a vessel 2 miles away. Lieutenant Zalinski declares that with the improve-

ments he has made it will be as easy and as safe to hurl 500 pounds of this explosive as 5 pounds.

Three iron mills in Pittsburgh are now supplied by the Pennsylvania National Gas Company, and three others will be supplied before another month.

A dentist's vulcanizer in Philadelphia exploded, and pieces of the brass cylinders tore through the ceiling and shattered the doors and window sills. A patient under treatment was severely shocked.

The California wheat harvest has been gathered, and the *San Francisco Commercial Herald* says: "The expectations of a great total yield have not been disappointed."

Every fire insurance company doing business in this city has signed an agreement to establish ratings on all property in the metropolitan district, and to establish a uniform commission of 10 per cent. to brokers. For the first time in many years the fire companies in New York are in harmony on this subject.

The cost of the proposed conversion into a coal hulk of the *Great Eastern* is estimated at from about \$100,000 to \$150,000.

Russian transportation companies have arranged to reduce the freight rate on Caucasian petroleum to Austria and Germany to 1 rouble per cwt. From Baku to Trieste the rate will be only 4 florins. Hungarian refiners have already purchased at Baku petroleum amounting in value to 5,000,000 gulden.

The cost of the great railroad strike on the Southwestern system has been calculated by J. S. Delay, a prominent Knight of Labor who acted as secretary of the joint committee of District Assemblies Nos. 101 and 17.

He has been traveling through Texas with Master Workman T. B. McGuire, of New York, during the past month, disbursing money for the General Executive Board of

the Knights and alleviating the distress caused by the strike. He says the cost of the Gould system strike to the General Board was \$100,000 and in loss of wages to strikers \$1,000,000. These figures, he said, were official. The cost of the strike to railroads had been placed at \$3,500,000 by Attorney Portis and Superintendent Kerrigan.

An empty glycerine can which had been used near Bradford, Pa., exploded while the solder was being melted off, instantly killing a tramp who was converting it into a pail. It is supposed that a few drops of the explosive substance remained in the crevices.

A favorable report has been obtained in Congress by Mr. James upon the bill introduced by him authorizing the purchase of the Seaman's Retreat on Staten Island for a marine hospital. The purchase of this ground has been recommended by six different Secretaries of the Treasury and by all the supervising surgeon-generals of the Marine Hospital service for the past 10 years.

The President issued the commission of Hugh S. Thompson to be Assistant Secretary of the Treasury, and the Senate confirmed the nominations of G. V. Brower, general appraiser at New York, and D. J. Moore, assistant appraiser at New York.

Commodore Schufeldt, recently retired from the United States navy, takes no exception to the personnel of the United States navy as compared with any other country, but of material we have none. This, he says, "is the disgrace. In the event of a war the naval armament of the United States could be swept from the seas by some of the iron-clad fleets of other countries. We want powerful ships—we want ships that won't sink; ships that have speed, and ships that can carry long guns. When we have these we will have a navy. As it is now, States that are insignificant and puny beside this great nation boast of men-of-war that surpass anything we have. It is not with the navy as it is with the army. An army can be raised from the militia in quick time. But a navy cannot be built in a day; it is like Rome. Ships require time to build, and sailors and officers require time to train and discipline." Commodore Schufeldt says that only the prospect of a war can rouse the country from its indifference, which he attributes to the controlling influence in Congress of the interior States.

The contract for the ironwork on the new Federal building on Washington street, Brooklyn, was awarded to the lowest bidder, the East River Iron Works, for \$14,000. The contract calls for the ironwork on the first story and the iron floor beams of the second story.

The Pennsylvania Railroad Company are experimenting with natural gas, which they propose to use in many of their engines if feasible.

The New York Custom-House has pending some 1500 to 1800 claims for refunds arising out of the Oberteuffer decision regarding coverings. Assistant Auditor Stanwood states that so far very little money has been paid, as the claims are not only numerous, but intricate. It is roughly estimated that the balance, which may prove to be at least \$4,000,000, will not be finally paid for two or possibly three years.

Fire Chief Shay, referring to the burning of the Boston Institute building, where wire screens in the windows prevented several workmen from escaping, says many factories in New York are equally dangerous.

The steel cruiser *Atlanta*, built by John Roach, recently made a successful trial of her machinery. She is 3000 tons burden, her length over all is 290 feet and 270 feet at the water line. Her breadth of beam is 45 feet and her present draft 10 feet forward and 17½ feet aft. With her armament, stores and coal aboard she is expected to average 17 feet draft. There are three engines of the latest pattern, with a total of 3500 horse-power, which are expected to drive her in ordinary weather 15 knots an hour. The machinery, steering gear and magazines are all protected by 2-inch steel

armor-plates. The vessel is divided into 52 water-tight compartments, which can be separately or jointly closed at will. She has two square-rigged masts, with a good spread of canvas.

The Spanish ministers at Madrid decide to substitute fast cruisers of great speed as quickly as possible for the present costly navy, and will ask for the approval of the Cortes. The new vessels will consume but little fuel and will probably not exceed 5000 tons. They will be supplemented by a number of torpedo-boats of the first and second class.

The Railroad Commission announces its decision in regard to the car-coupling tests made at East Albany last month. They award the first place to the Hoag coupler. This is an invention not in use on any railroad at present. It is the work of C. M. Hoag, of Greenbush, an engineer on the Boston and Albany Railroad. At the trial it was the only one that made the "flying switch" automatically. In its normal condition the link is level, and works successfully on all cars.

The aqueduct commissioners have decided to purchase in fee simple a strip of land inclosing the new aqueduct, 29½ miles long and 66 feet wide, from Croton Lake to Harlem River. It will cost about \$70,000. The commissioners will have the right to inclose the land whenever they deem it necessary to protect the aqueduct.

The new Erie ferry-boat John King was built by Cramp & Sons at a cost of \$125,000.

A Halifax dispatch says the Canadian admiral, the collector at Digby and others concerned in the alleged illegal seizure of the American schooner *David J. Adams* have been sued by the owner of the vessel for damages, and that the owner of the *Ella M. Doughty* will proceed against the Canadian officials in like manner.

Six boycotters, charged with conspiring to injure the business of Mrs. Landgraf, were convicted and sentenced by Judge Barrett to short terms of imprisonment. Ten were not identified and one was discharged. Hereafter, Judge Barrett remarked, no one can plead ignorance of the law.

The Philadelphia syndicate has turned over the property of the Broadway Road to Receiver O'Brien, and an agreement was signed by which the road will be operated by the Seventh Avenue Company until the legal question at issue can be decided. A case will at once be made up to test the constitutionality of the recent acts of the Legislature annulling the charter.

It is authoritatively reported that the Old Colony Railroad and Steamboat Company contemplate purchasing the Fall River Iron Works property, upon which to erect headquarters for their freight and passenger traffic. The assessed valuation of the property is \$300,000.

Three boilers exploded at the colliery of the Delaware and Hudson Canal Company, near Wilkesbarre, Pa., wrecking the building and fatally injuring the engineer and fireman.

The law of the State of New York which prohibits the employment of children under 13 years of age in manufacturing establishments, and provides that women under 21 years of age shall not be employed more than 60 hours in any one week, has gone into effect.

A telegram from Pittsburgh says the use of natural gas in the manufactories of that city has done away with the consumption of 189,850 bushels of coal a day. "In 250 working days, which is considered a year by manufacturers, the whole amount of coal displaced would run up to 47,450,000 bushels. Calculating 100 bushels to be an average day's output for a coal miner, it would take 1600 coal miners to dig this coal, but altogether the use of natural gas has thrown about 5000 men out of work in this region. It required the use of 633 railroad cars to transport the coal. Each of these, 30 feet in length, would make a string more than 3 miles long."

The annual settlement at the Philadelphia Mint shows that the weight of the silver coin handled was 841 net tons, and gold coin 13 net tons. The total value was \$34,567,697.31, of which a little more than \$6,500,000 was gold. In the coinier's department of the Mint the examiners found that during the year just closed the silver settlement has been the heaviest ever made, and the gold next to the largest. The settlement shows that the coinier had operated on 3½ tons of gold and 1337½ tons of silver bullion. In the melter and refiner's department the examiners found that Prof. J. C. Booth had operated on 48½ tons of gold bullion and on 1361 tons of silver bullion, making in all 12,867 melts.

A firm in Montreal on the 6th inst. shipped six carloads of Manitoba flour to the Pacific Coast via the Canadian Pacific Railroad. They claim to have already succeeded to a great extent in arresting the importation of Oregon flour into British Columbia, "the strong flour produced from Manitoba wheat being preferred to the weaker quality produced in Oregon."

The ocean and inland tonnage arriving at Montreal this year has largely increased, compared with 1885.



## NEW PUBLICATIONS.

POOR'S DIRECTORY OF RAILWAY OFFICIALS AND RAILWAY DIRECTORS, 1886. Size 9 x 6 inches, 388 pages. Published by H. V. & H. W. Poor. Price \$2.

The directory is designed to supplement "Poor's Manual of Railroads," by presenting in a convenient form for reference the names of all persons connected in an official capacity with the railroad interests in the United States. By publishing this information in a separate book opportunity has been gained for enlarging the lists which have appeared in the Manual. To the names of the officers and directors of the railroad companies there have been added the names of the officers of railways in other countries on this continent, with much other information frequently sought after in regard to such foreign roads, as well as the names of officials of horse railroads in this and other countries, and the names of persons in various industries and institutions affiliated with the railroad system, such as contractors, bridge builders, railroad commissioners, &c. It is the intention of the publishers to issue the directory annually. The Manual, which is also issued annually, will continue to give the names of the directors and corporate officers of each company. The information contained in "Poor's Directory" will undoubtedly prove of much value and service to many. It is to be regretted, however, that the arrangements of tables had not been done in a way more conducive to rapid reference.

M. Concuera, a Mexican iron manufacturer, who is now in Pittsburgh buying machinery, says the iron business in his country does not amount to much. He says: "We have ore there, plenty of it, and the best ore that can be found in any place, I guess, but there is no market for the iron after it is made. Some years ago a big company was formed by Chicago capitalists for the purpose of manufacturing iron and steel in Mexico. They erected an extensive plant near the City of Mexico and squandered several hundred thousand dollars on it, but they were never able to build up a paying trade and now their plant is abandoned, or at least it has not been running for a number of months. They made good iron, and I think that if there had been any possibility of success they would have succeeded. About the only thing that iron or steel is used for down there is for railroads, and, as there are very few railroads, you can readily see that the business would not be lucrative." Another difficulty is the scarcity of coal or any other fuel available for iron manufacture.

The foundry of the Linn Iron Works, the largest in Birmingham, Ala., has been shut down for several days by a strike of 11 molders. This was caused by a difference in defining overtime, an unprecedented volume of work for the last few months having given this matter new importance. The men had agreed to accept the management's ruling, and were willing to go to work again, but the superintendent would not take back three of them, and under the laws of their union this keeps all of them out. Other molders who did not strike have been induced to quit, too, and some 30 helpers, core-makers and casting scrapers are necessarily thrown out of employment. This affair is the first exploit of the molders' union in Birmingham.

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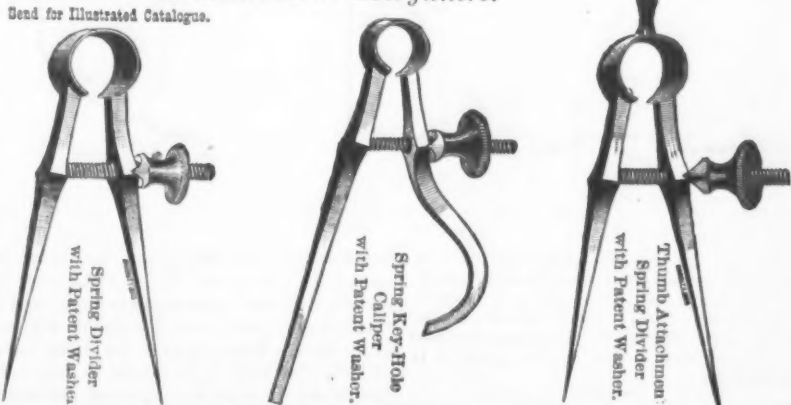
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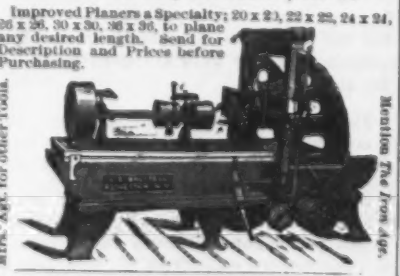
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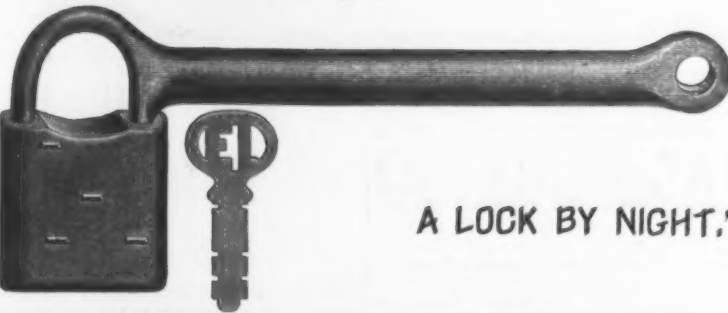
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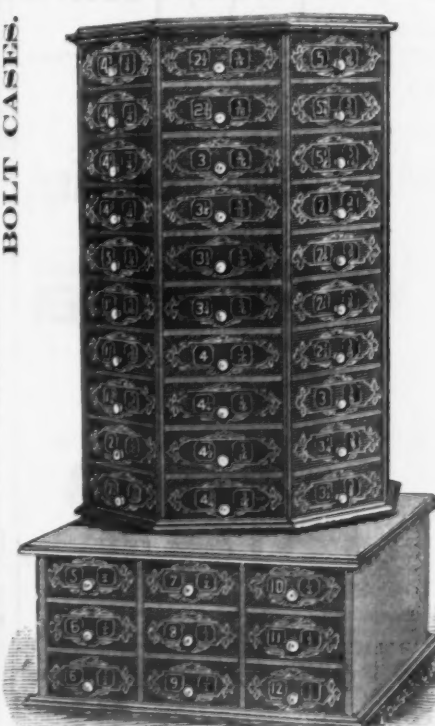
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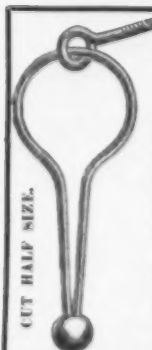
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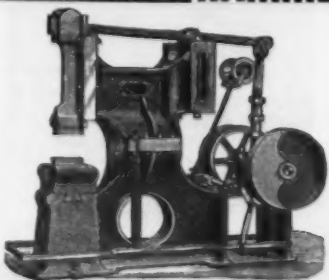
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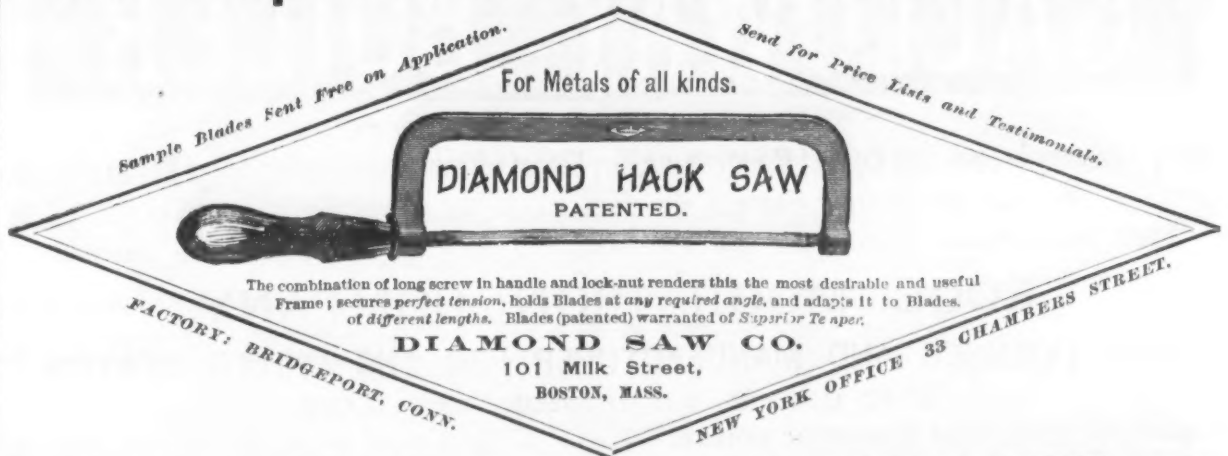
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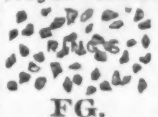
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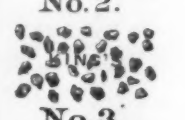
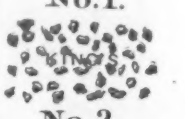
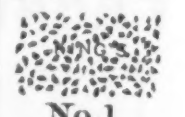
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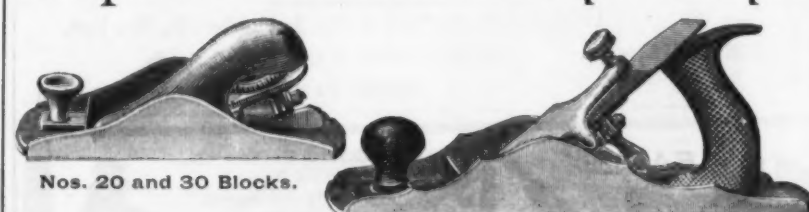
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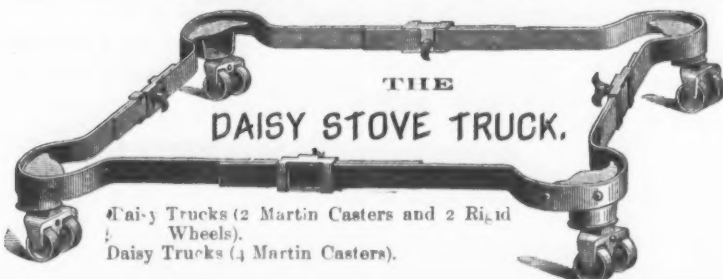
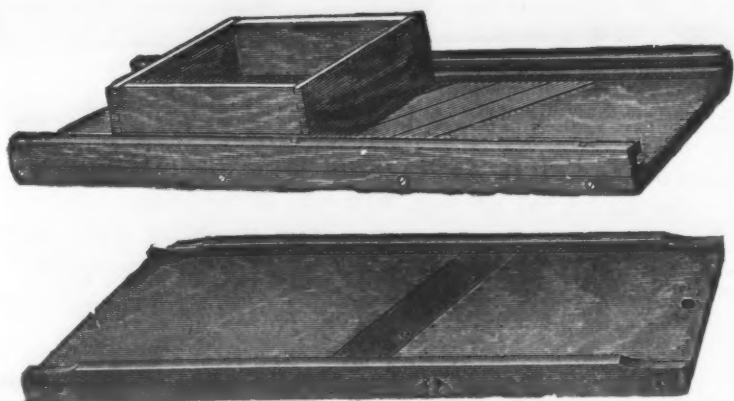


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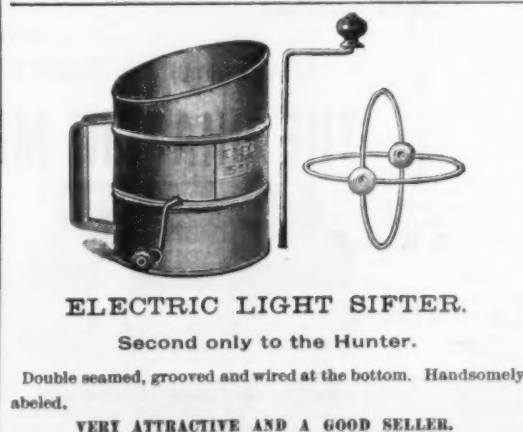
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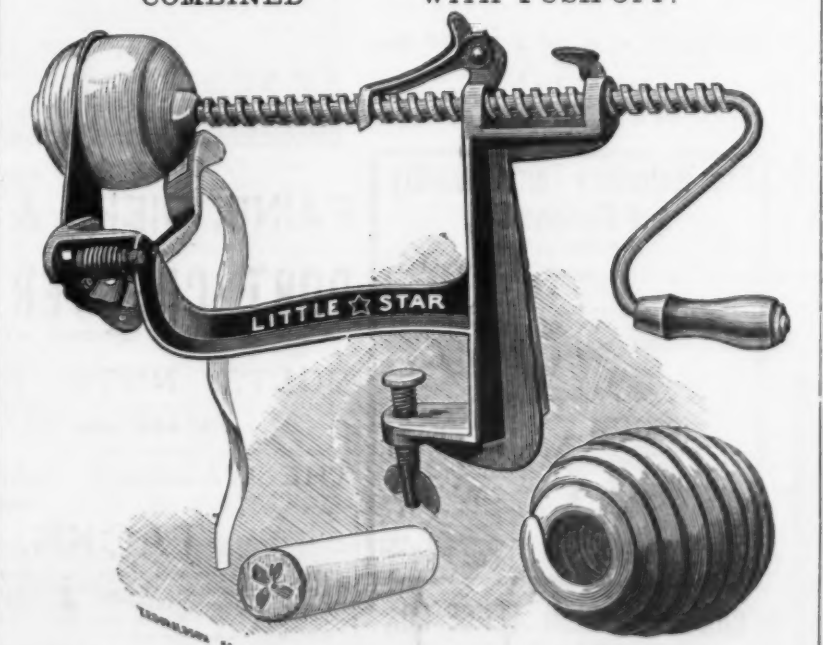
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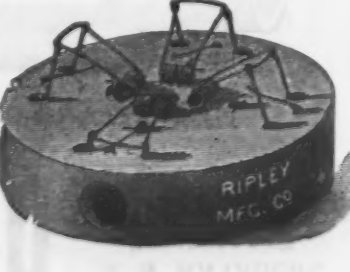
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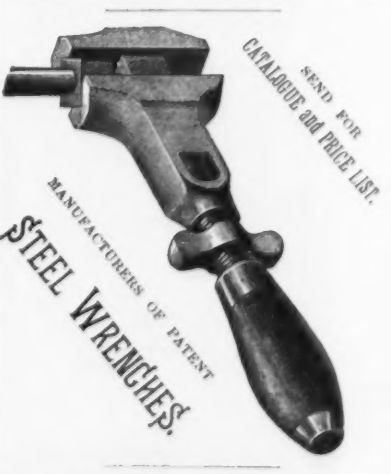
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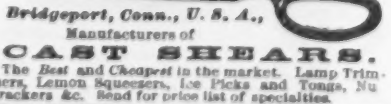


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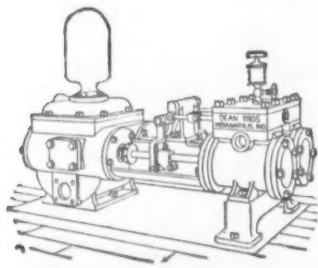
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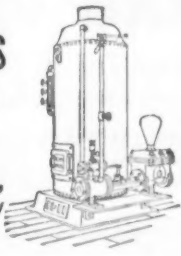
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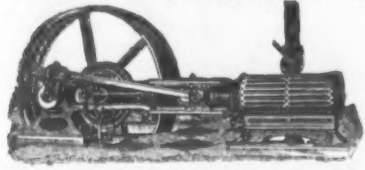




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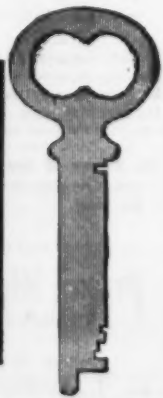
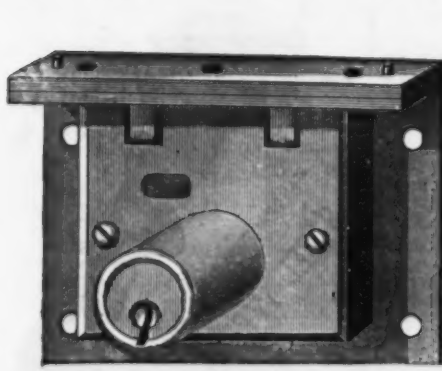
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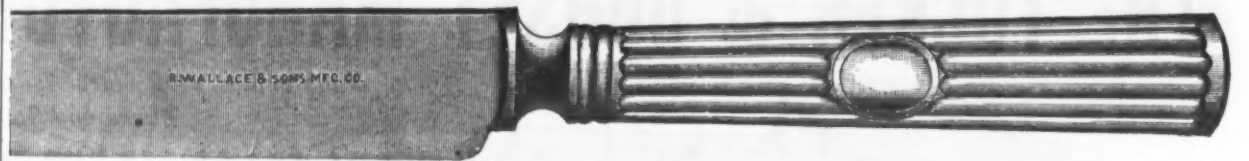
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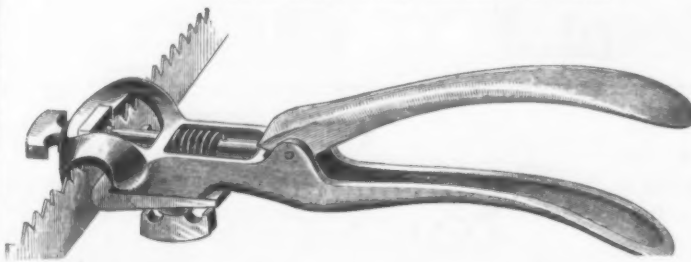


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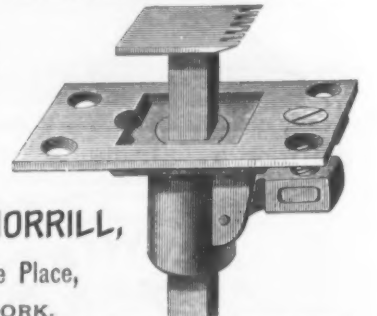
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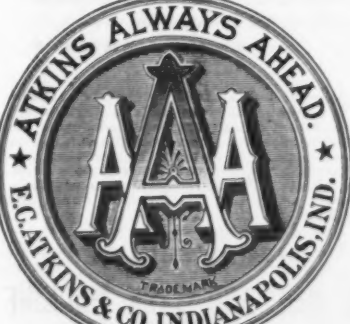
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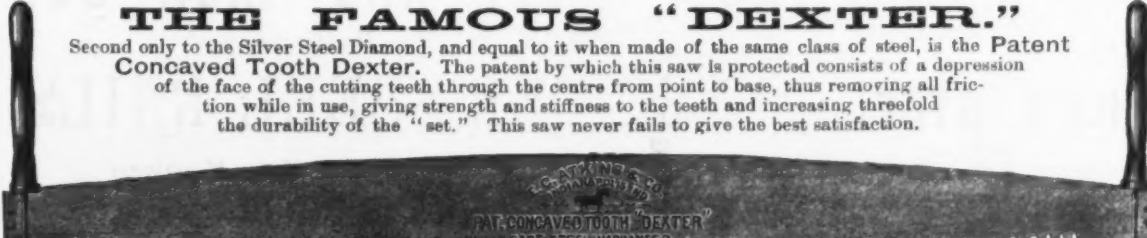
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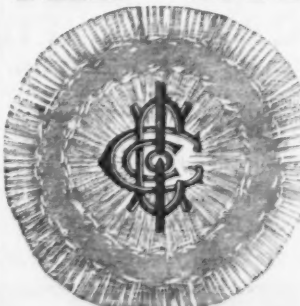
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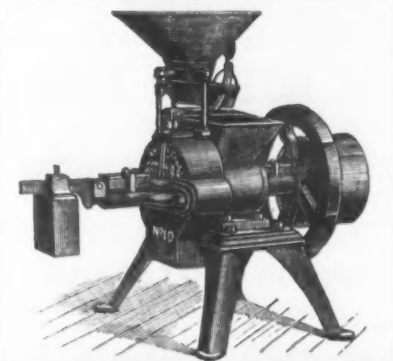
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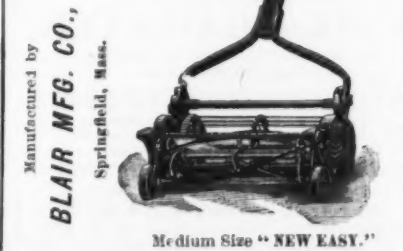


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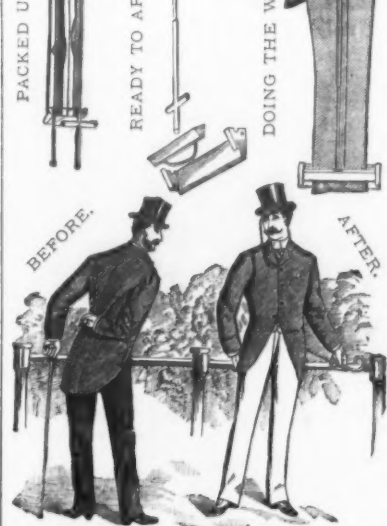
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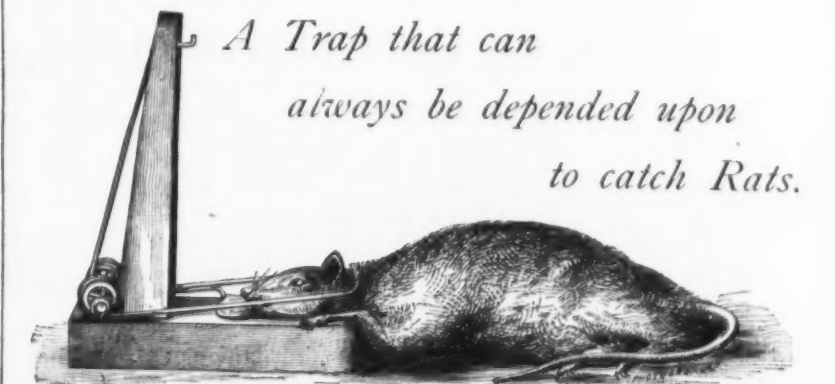
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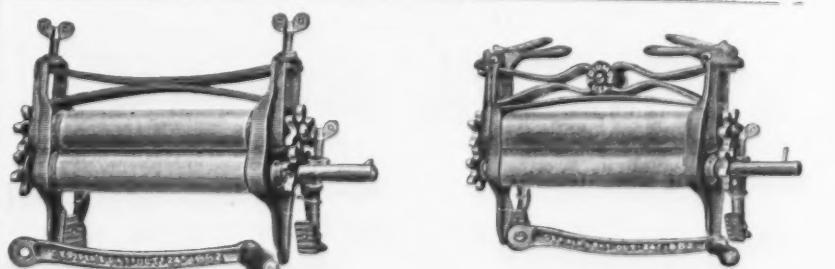


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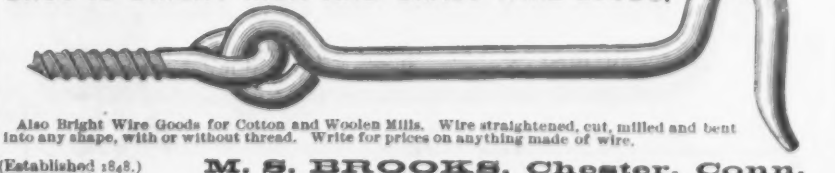
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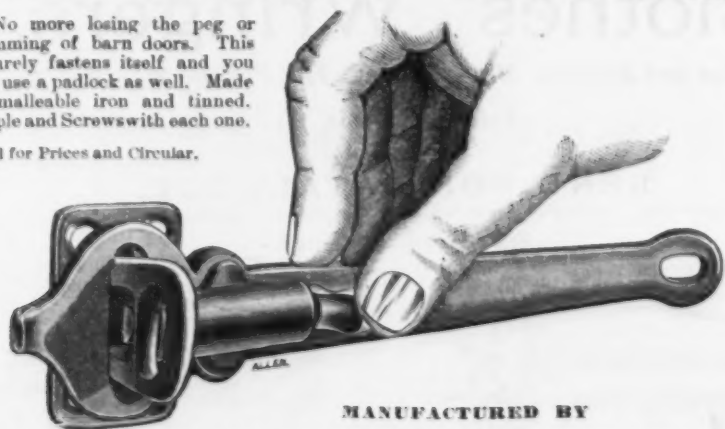


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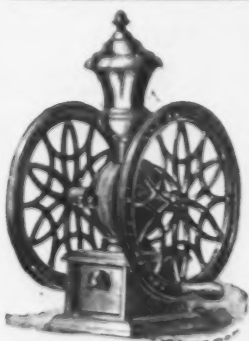
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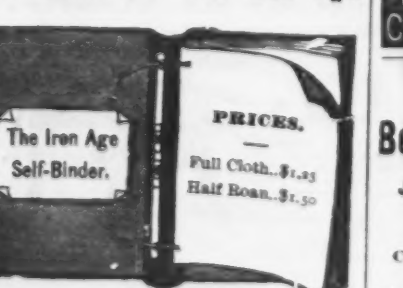
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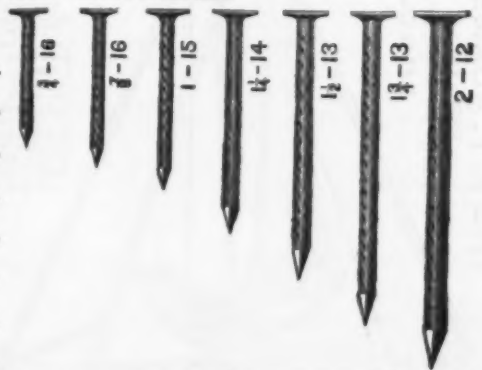
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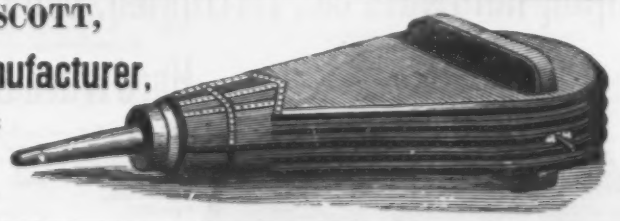
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Angular, without Augers. . . . .	dis. 50 00
<b>Boils.</b> —Eastern Carriage Boils new list June 10	
Phila. Carriage Boils new list Jan. 1, 1884, dis. 75 @ 75 1/2	108 1/2
Stanley, Wrought Shutter. . . . .	dis. 60 10
<b>Braces.</b> —Barber's Improved . . . . .	
Backus, Polished . . . . .	dis. 60 @ 10 @ 60 1/2
Backus, Nickelplated . . . . .	dis. 60 @ 10 @ 60 1/2
American Ball . . . . .	dis. 55 10
Amidon Improved . . . . .	dis. 60 @ 60 1/2
Stanton Corner Brace . . . . .	dis. 40 @ 40 1/2
<b>Bits.</b>	
Cast Fast Joint, Narrow . . . . .	dis. 60 00
Cast Fast Joint, Broad . . . . .	dis. 60 10
Cast Loose Joint, Narrow . . . . .	dis. 60 00
Cast Loose Joint, Broad . . . . .	dis. 60 00
Cast Acorn, Loose Pin . . . . .	dis. 70 @ 70 1/2
Cast Acorn, Japanned . . . . .	dis. 70 @ 70 1/2
Cast Acorn's Loose Joint . . . . .	dis. 65 00
Wrought Loose Pin . . . . .	dis. 65 00
Wrought Table Hinges and Back Flaps . . . . .	dis. 65 00
Wrought Table Hinges . . . . .	dis. 65 00
Wrought Ratchet . . . . .	dis. 65 00
<b>Blind Butts.</b>	
Farker . . . . .	dis. 75 00
Shepard . . . . .	dis. 75 @ 10 @ 80 1/2
Laill & Porter . . . . .	dis. 80 00
Russell's . . . . .	dis. 80 00
<b>Boilers.</b> —Bed (new list July 1, 1880) Plate. . . . .	
dis. 60 @ 60 1/2	
<b>Chains.</b> —German Halter and Coll. list June, 1881	
dis. 55 @ 55 1/2	
Best of Hand Chain . . . . .	
dis. 55 @ 55 1/2	
Best Proof Coll Chain—English. . . . .	
dis. 55 @ 55 1/2	
$\frac{1}{2}$ D. . . . .	5 1/2
$\frac{3}{4}$ D. . . . .	5 1/2
$1\frac{1}{2}$ D. . . . .	5 1/2
$2\frac{1}{2}$ D. . . . .	5 1/2
$3\frac{1}{2}$ D. . . . .	5 1/2
$4\frac{1}{2}$ D. . . . .	5 1/2
$5\frac{1}{2}$ D. . . . .	5 1/2
$6\frac{1}{2}$ D. . . . .	5 1/2
$7\frac{1}{2}$ D. . . . .	5 1/2
$8\frac{1}{2}$ D. . . . .	5 1/2
$9\frac{1}{2}$ D. . . . .	5 1/2
$10\frac{1}{2}$ D. . . . .	5 1/2
$11\frac{1}{2}$ D. . . . .	5 1/2
$12\frac{1}{2}$ D. . . . .	5 1/2
$13\frac{1}{2}$ D. . . . .	5 1/2
$14\frac{1}{2}$ D. . . . .	5 1/2
$15\frac{1}{2}$ D. . . . .	5 1/2
$16\frac{1}{2}$ D. . . . .	5 1/2
$17\frac{1}{2}$ D. . . . .	5 1/2
$18\frac{1}{2}$ D. . . . .	5 1/2
$19\frac{1}{2}$ D. . . . .	5 1/2
$20\frac{1}{2}$ D. . . . .	5 1/2
$21\frac{1}{2}$ D. . . . .	5 1/2
$22\frac{1}{2}$ D. . . . .	5 1/2
$23\frac{1}{2}$ D. . . . .	5 1/2
$24\frac{1}{2}$ D. . . . .	5 1/2
$25\frac{1}{2}$ D. . . . .	5 1/2
$26\frac{1}{2}$ D. . . . .	5 1/2
$27\frac{1}{2}$ D. . . . .	5 1/2
$28\frac{1}{2}$ D. . . . .	5 1/2
$29\frac{1}{2}$ D. . . . .	5 1/2
$30\frac{1}{2}$ D. . . . .	5 1/2
$31\frac{1}{2}$ D. . . . .	5 1/2
$32\frac{1}{2}$ D. . . . .	5 1/2
$33\frac{1}{2}$ D. . . . .	5 1/2
$34\frac{1}{2}$ D. . . . .	5 1/2
$35\frac{1}{2}$ D. . . . .	5 1/2
$36\frac{1}{2}$ D. . . . .	5 1/2
$37\frac{1}{2}$ D. . . . .	5 1/2
$38\frac{1}{2}$ D. . . . .	5 1/2
$39\frac{1}{2}$ D. . . . .	5 1/2
$40\frac{1}{2}$ D. . . . .	5 1/2
$41\frac{1}{2}$ D. . . . .	5 1/2
$42\frac{1}{2}$ D. . . . .	5 1/2
$43\frac{1}{2}$ D. . . . .	5 1/2
$44\frac{1}{2}$ D. . . . .	5 1/2
$45\frac{1}{2}$ D. . . . .	5 1/2
$46\frac{1}{2}$ D. . . . .	5 1/2
$47\frac{1}{2}$ D. . . . .	5 1/2
$48\frac{1}{2}$ D. . . . .	5 1/2
$49\frac{1}{2}$ D. . . . .	5 1/2
$50\frac{1}{2}$ D. . . . .	5 1/2
$51\frac{1}{2}$ D. . . . .	5 1/2
$52\frac{1}{2}$ D. . . . .	5 1/2
$53\frac{1}{2}$ D. . . . .	5 1/2
$54\frac{1}{2}$ D. . . . .	5 1/2
$55\frac{1}{2}$ D. . . . .	5 1/2
$56\frac{1}{2}$ D. . . . .	5 1/2
$57\frac{1}{2}$ D. . . . .	5 1/2
$58\frac{1}{2}$ D. . . . .	5 1/2
$59\frac{1}{2}$ D. . . . .	5 1/2
$60\frac{1}{2}$ D. . . . .	5 1/2
$61\frac{1}{2}$ D. . . . .	5 1/2
$62\frac{1}{2}$ D. . . . .	5 1/2
$63\frac{1}{2}$ D. . . . .	5 1/2
$64\frac{1}{2}$ D. . . . .	5 1/2
$65\frac{1}{2}$ D. . . . .	5 1/2
$66\frac{1}{2}$ D. . . . .	5 1/2
$67\frac{1}{2}$ D. . . . .	5 1/2
$68\frac{1}{2}$ D. . . . .	5 1/2
$69\frac{1}{2}$ D. . . . .	5 1/2
$70\frac{1}{2}$ D. . . . .	5 1/2
$71\frac{1}{2}$ D. . . . .	5 1/2
$72\frac{1}{2}$ D. . . . .	5 1/2
$73\frac{1}{2}$ D. . . . .	5 1/2
$74\frac{1}{2}$ D. . . . .	5 1/2
$75\frac{1}{2}$ D. . . . .	5 1/2
$76\frac{1}{2}$ D. . . . .	5 1/2
$77\frac{1}{2}$ D. . . . .	5 1/2
$78\frac{1}{2}$ D. . . . .	5 1/2
$79\frac{1}{2}$ D. . . . .	5 1/2
$80\frac{1}{2}$ D. . . . .	5 1/2
$81\frac{1}{2}$ D. . . . .	5 1/2
$82\frac{1}{2}$ D. . . . .	5 1/2
$83\frac{1}{2}$ D. . . . .	5 1/2
$84\frac{1}{2}$ D. . . . .	5 1/2
$85\frac{1}{2}$ D. . . . .	5 1/2
$86\frac{1}{2}$ D. . . . .	5 1/2
$87\frac{1}{2}$ D. . . . .	5 1/2
$88\frac{1}{2}$ D. . . . .	5 1/2
$89\frac{1}{2}$ D. . . . .	5 1/2
$90\frac{1}{2}$ D. . . . .	5 1/2
$91\frac{1}{2}$ D. . . . .	5 1/2
$92\frac{1}{2}$ D. . . . .	5 1/2
$93\frac{1}{2}$ D. . . . .	5 1/2
$94\frac{1}{2}$ D. . . . .	5 1/2
$95\frac{1}{2}$ D. . . . .	5 1/2
$96\frac{1}{2}$ D. . . . .	5 1/2
$97\frac{1}{2}$ D. . . . .	5 1/2
$98\frac{1}{2}$ D. . . . .	5 1/2
$99\frac{1}{2}$ D. . . . .	5 1/2
$100\frac{1}{2}$ D. . . . .	5 1/2
<b>Chisels.</b> —Socket Framing . . . . .	
dis. 75 @ 75 1/2	
Socket Firmer . . . . .	
dis. 75 @ 75 1/2	
Butcher's . . . . .	
\$5 00 @ \$5.25 to \$5.00	
<b>Coffee Mills.</b> —Box and Side (new list Jan. 1)	
Enterprise . . . . .	
dis. 20 @ 10 00	
<b>Cutlery.</b> —Walden Pocket . . . . .	
new list Jan. 1	
Pennsylvania Knife Co. . . . .	
new list Jan. 1	
Best of Frary & Clark, Russell & . . . . .	
dis. 10 @ 10 1/2	
Goodwin Mfg. Co. and Meriden Cutlery Co., Man-	
ufacturers' prices act.	
<b>Door Hangers.</b> —Bronk Bar Door Hangers. . . . .	
dis. 50 @ 50 1/2	
American Parlor Door Hangers. . . . .	
\$6.00; dis. 50 @ 50 1/2	
<b>Drawing Knives.</b>	
Lat Mfg. Co. . . . .	
dis. 75 @ 75 1/2	
Rustic Handle. . . . .	
dis. 50 @ 50 1/2	
<b>Files.</b>	
Nicholson . . . . .	
dis. 10 @ 10 1/2	
Diston . . . . .	
dis. 10 @ 10 1/2	
Best of Nicholson . . . . .	
dis. 10 @ 10 1/2	
Crown and Arrow . . . . .	
dis. 10 @ 10 1/2	
<b>Fluting Machines.</b>	
Eagle—36 in. roll . . . . .	
each, \$2 15	
dis. 2 @ 2 1/2	
Crown—48 in. roll . . . . .	
each, 3.00	
dis. 3 @ 3 1/2	
Crown—6 in. roll . . . . .	
each, 1.50	
dis. 4 @ 1 1/2	
Geneva Fluter . . . . .	
dis. 25 00	
Favorite com. Fluter and Sad Iron. $\frac{1}{2}$ doz. . . . .	
\$15.00 net	
<b>Fry Pans.</b>	
W. H. Fry & Co. . . . .	
dis. 70 00	
$\frac{1}{2}$ doz. . . . .	
\$1.00 3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00	
No. . . . .	
0 1 2 3 4 5 6	
<b>Hammers.</b>	
Crown & Plumb's, new list . . . . .	
dis. 40 @ 40 1/2	
Mordale Hammers, new list. . . . .	
dis. 22 @ 22 1/2	
Howell A. E. Nail Hammers . . . . .	
$\frac{1}{2}$ doz. net, \$3 00	
<b>Handles.</b>	
Boynton Loop Handles Cross-Cut . . . . .	
33 $\frac{1}{2}$ pair net	
Boynton Loop Handles Cross-Cut . . . . .	
300 pair net	
<b>Hatchets.</b>	
Yerkes & Plumb, new list. . . . .	
dis. 40 @ 40 1/2	
<b>Hay and Straw Knives.</b>	
Lightning. . . . .	
$\frac{1}{2}$ doz. \$18.00, dis. 10 @ 10 1/2	
Electric. . . . .	
$\frac{1}{2}$ doz. \$5.00, dis. 10 @ 10 1/2	
Walton. . . . .	
$\frac{1}{2}$ doz. \$5.00, dis. 10 @ 10 1/2	
Walton Straw Knives . . . . .	
dis. net, 17 00	
Gem Hay Knife . . . . .	
$\frac{1}{2}$ doz \$15.00, dis. 10 @ 10 1/2	
<b>Hinges.</b>	
Trap and T. . . . .	
dis. 65 @ 65 1/2	
Globe . . . . .	
dis. 23 2	

Merchant Iron.	
TERMS.—Note or acceptance at 90 days, with current rate of exchange on New York, or a discount of 2 per cent, for cash if remitted within 10 days from date of invoice.	
<b>For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.</b>	
The following are card rates.	
<b>Flat Bar.</b>	
1½ to 4 by ½ to 1.....	2.04
4 to 6 by ½ to 1.....	2.19
6 to 8 by ½ to 1.....	2.34
1 to 1½.....	2.04
1½ to 2.....	2.19
2 to 3.....	2.34
3 to 4.....	2.49
4 to 6.....	2.64
6 to 8.....	2.79
8 to 10.....	2.94
10 to 12.....	3.09
12 to 14.....	3.24
14 to 16.....	3.39
16 to 18.....	3.54
18 to 20.....	3.69
20 to 22.....	3.84
22 to 24.....	3.99
24 to 26.....	4.14
26 to 28.....	4.29
28 to 30.....	4.44
30 to 32.....	4.59
32 to 34.....	4.74
34 to 36.....	4.89
36 to 38.....	5.04
38 to 40.....	5.19
40 to 42.....	5.34
42 to 44.....	5.49
44 to 46.....	5.64
46 to 48.....	5.79
48 to 50.....	5.94
50 to 52.....	6.09
52 to 54.....	6.24
54 to 56.....	6.39
56 to 58.....	6.54
58 to 60.....	6.69
60 to 62.....	6.84
62 to 64.....	6.99
64 to 66.....	7.14
66 to 68.....	7.29
68 to 70.....	7.44
70 to 72.....	7.59
72 to 74.....	7.74
74 to 76.....	7.89
76 to 78.....	8.04
78 to 80.....	8.19
80 to 82.....	8.34
82 to 84.....	8.49
84 to 86.....	8.64
86 to 88.....	8.79
88 to 90.....	8.94
90 to 92.....	9.09
92 to 94.....	9.24
94 to 96.....	9.39
96 to 98.....	9.54
98 to 100.....	9.69
100 to 102.....	9.84
102 to 104.....	9.99
104 to 106.....	10.14
106 to 108.....	10.29
108 to 110.....	10.44
110 to 112.....	10.59
112 to 114.....	10.74
114 to 116.....	10.89
116 to 118.....	11.04
118 to 120.....	11.19
120 to 122.....	11.34
122 to 124.....	11.49
124 to 126.....	11.64
126 to 128.....	11.79
128 to 130.....	11.94
130 to 132.....	12.09
132 to 134.....	12.24
134 to 136.....	12.39
136 to 138.....	12.54
138 to 140.....	12.69
140 to 142.....	12.84
142 to 144.....	12.99
144 to 146.....	13.14
146 to 148.....	13.29
148 to 150.....	13.44
150 to 152.....	13.59
152 to 154.....	13.74
154 to 156.....	13.89
156 to 158.....	14.04
158 to 160.....	14.19
160 to 162.....	14.34
162 to 164.....	14.49
164 to 166.....	14.64
166 to 168.....	14.79
168 to 170.....	14.94
170 to 172.....	15.09
172 to 174.....	15.24
174 to 176.....	15.39
176 to 178.....	15.54
178 to 180.....	15.69
180 to 182.....	15.84
182 to 184.....	15.99
184 to 186.....	16.14
186 to 188.....	16.29
188 to 190.....	16.44
190 to 192.....	16.59
192 to 194.....	16.74
194 to 196.....	16.89
196 to 198.....	17.04
198 to 200.....	17.19
200 to 202.....	17.34
202 to 204.....	17.49
204 to 206.....	17.64
206 to 208.....	17.79
208 to 210.....	17.94
210 to 212.....	18.09
212 to 214.....	18.24
214 to 216.....	18.39
216 to 218.....	18.54
218 to 220.....	18.69
220 to 222.....	18.84
222 to 224.....	18.99
224 to 226.....	19.14
226 to 228.....	19.29
228 to 230.....	19.44
230 to 232.....	19.59
232 to 234.....	19.74
234 to 236.....	19.89
236 to 238.....	20.04
238 to 240.....	20.19
240 to 242.....	20.34
242 to 244.....	20.49
244 to 246.....	20.64
246 to 248.....	20.79
248 to 250.....	20.94
250 to 252.....	21.09
252 to 254.....	21.24
254 to 256.....	21.39
256 to 258.....	21.5

# List of Extras.

7x7.....	3.5¢	6x4.....	1.0¢	5x7-10.....	1.0¢
8x4.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x6.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x8.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x10.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x12.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x14.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x16.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x18.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x20.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x22.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x24.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x26.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x28.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x30.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x32.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x34.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x36.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x38.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x40.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x42.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x44.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x46.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x48.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x50.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x52.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x54.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x56.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x58.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x60.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x62.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x64.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x66.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x68.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x70.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x72.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x74.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x76.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x78.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x80.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x82.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x84.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x86.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x88.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x90.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x92.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x94.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x96.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x98.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢
8x100.....	2.5¢	6x4.....	1.0¢	4x8.....	1.0¢

All unenumerated sizes will be charged at price of next larger dimension in list. Cutting to multiples or special lengths, 10¢ per foot for over 24 inch; under, according to contract.

# Crucible Steels.

<b>CRUCIBLE MACHINERY, ROUNDS AND SQUARES.</b>					
3/4 to 3 inches inc.....	base, 4.5¢	3/4 to 7-10 inch.....	extra, 0.5¢		
3/4 to 4 inch.....	extra, 1.5¢	10 to 12 and 13 inch.....	extra, 1.5¢		
4 to 5 inch.....	extra, 1.5¢	4 and 9-32.....	extra, 1.5¢		
5 to 6 inch.....	extra, 1.5¢	3-16 inch.....	extra, 3.0¢		
6 to 7 inch.....	extra, 1.5¢	1/2 to 11-16 inch.....	extra, 3.0¢		

Octagons, 5¢ extra throughout the list. Flat, one inch extra of the Flat Tool Steel classification. Cutting to special lengths, 15¢ per foot for over 24 inch; for anything over 24 inches long. For length 24 inches or less, according to special contract.

1/4 to 1/2 in. x No. 4 gauge to 1/4 in. inc.....	base, 4.0¢				
1/2 to 3/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
3/4 to 1 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
1 to 1 1/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
1 1/4 to 1 1/2 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
1 1/2 to 1 3/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
1 3/4 to 2 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
2 to 2 1/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
2 1/4 to 2 1/2 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
2 1/2 to 2 3/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
2 3/4 to 3 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
3 to 3 1/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
3 1/4 to 3 1/2 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
3 1/2 to 3 3/4 in. x No. 4 gauge to 1/4 in. inc.....	extra, 0.2¢				
3 3/4 to 4 in.					

Cut to length, 24 inches and under, according to special contract.

<b>CRUCIBLE SPRING STEEL.</b>					
3/4 to 1 1/4 inches, base, 2.9¢	5-16 inch.....	extra, 1.0¢			
1 1/4 to 1 1/2 inches, base, 2.9¢	1/4 inch.....	extra, 1.5¢			
1 1/2 to 1 3/4 inches, base, 2.9¢	3/4 inch.....	extra, 1.5¢			
1 3/4 to 2 inches, base, 2.9¢	1 inch.....	extra, 1.5¢			
2 to 2 1/4 inches, base, 2.9¢	1 1/4 inch.....	extra, 1.5¢			
2 1/4 to 2 1/2 inches, base, 2.9¢	1 1/2 inch.....	extra, 1.5¢			
2 1/2 to 2 3/4 inches, base, 2.9¢	1 3/4 inch.....	extra, 1.5¢			
2 3/4 to 3 inches, base, 2.9¢	2 inch.....	extra, 1.5¢			
3 to 3 1/4 inches, base, 2.9¢	2 1/4 inch.....	extra, 1.5¢			
3 1/4 to 3 1/2 inches, base, 2.9¢	2 1/2 inch.....	extra, 1.5¢			
3 1/2 to 3 3/4 inches, base, 2.9¢	2 3/4 inch.....	extra, 1.5¢			
3 3/4 to 4 inches, base, 2.9¢	3 inch.....	extra, 1.5¢			

To 31 gauge for best quality, and for 22 gauge extra, 1.0¢; and for 14 gauge extra, 0.75¢; 20 gauge extra, 1.0¢; and for 10 gauge extra, 0.75¢.

# CRUCIBLE CIRCULARS.

Diameter.....	base, 11¢	Diameter.....	base, 11¢
To 46 inch.....	extra, 1.5¢	To 46 inch.....	extra, 1.5¢
48 inch.....	extra, 1.5¢	48 inch.....	extra, 1.5¢
50 inch.....	extra, 1.5¢	50 inch.....	extra, 1.5¢
52 to 54 inch.....	extra, 1.5¢	52 to 54 inch.....	extra, 1.5¢

# Bessemer and Open-Heart Steels.

<b>MACHINERY ROUNDS AND SQUARES.</b>					
3/4 to 3 inches inc.....	base, 2.5¢	3/4 to 11-16 inch inc.....	base, 0.3¢		
3/4 to 4 inches inc.....	extra, 0.5¢	1/4 to 7-16 inch inc.....	extra, 0.3¢		
4 to 5 inches inc.....	extra, 0.5¢	10 to 12 and 13 inch.....	extra, 0.3¢		
5 to 6 inches inc.....	extra, 0.5¢	4 and 9-32.....	extra, 0.3¢		
6 to 7 inches inc.....	extra, 0.5¢	3-16 inch.....	extra, 0.3¢		
7 to 8 inches inc.....	extra, 0.5¢	1/2 to 11-16 inch.....	extra, 0.3¢		

Machine cutting to specified lengths above 34 in. 0.3¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. Machine cutting to specified lengths, less than 12 in. 0.1¢ per foot. 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Heads, when not in complete Roller sets, to be 56  
 pound extra on each above grade, thickness and  
 size. No Steel to be sold as Marine Boiler Steel except  
 Best Roller grade. Tank Steel, not stamped, 5¢ per  
 pound less than Shell Steel, subject to same classification.

<b>Miscellaneous Cast Steel.</b>		Roller .....	54¢
Axle Steel for carriages	and wagons.....	Spindle, subject to Ma-	54¢
Frog Points & Plates	55¢	chin's classification.....	54¢
Frog Side Bars.....	56¢	Trap Spring Steel.....	54¢
Pick, plain (hammered)	56¢	Forged Crank Pins and	
Pick and Mallet, bev-	eled (rolled).....	Lathe Spindles.....	75¢
Skate Steel.....	45¢	Platen Rods, plain.....	46¢
Pike and Cant Hook....	56¢	Platen Rods, forged to	
Coal & Granite Wedge..	75¢	shapes.....	75¢
		Slide Bars, plain.....	54¢
		Do., forged to shapes....	75¢

<b>FILE CAST STEEL.</b>		Mill Saw, 8-in. and over..	54¢
Square, Round, Half Rod	and Flat Bastard, 8 in.	Taper, 3½-in. and over....	56¢
and over.....		Horse and Shoe Rasp.....	54¢

**SPRING CAST STEEL.**

Spiral, Taper, cut to lengths.....	54¢
Solid Safe Cast Steel.....	44¢
Three and Five Ply Cast Steel.....	44¢

**AGRICULTURAL IMPLEMENT CAST STEEL.**

Fork & Rake, Crucible.....	44¢	Corn Stalk Cutter, bev., 4¢	
Horse Rake Steel, cut to	lengths.....	beveled Hoe and Shovel	
Ho, Crucible.....	56¢	Steel Bars.....	44¢
		Cruc. Flow 8" in Slabs 4¢	

**Rolls and Castings.**

Furnace and Floor Plates.....	Per lb.
Sand Rolls over 15 inches diameter.....	14¢
Sand Rolls 12 inches diameter and under.....	24¢
Roll Pinions over 12 inches diameter.....	24¢
Roll Pinions 12 inches diameter and under.....	34¢
Housen and Rolling Mill Castings not otherwise	
specified.....	24¢
Splindles and Coupling Boxes.....	34¢
Squeezer Castings.....	24¢
Squeezer Pinions and Wheels.....	24¢
Spur and Bevel Wheels, large.....	34¢
Spur and Bevel Wheels, small.....	24¢
Pulleys, up to 20 inches.....	44¢
Pulleys, over 20 inches.....	44¢
Engine Castings, light.....	44¢
Engine Castings, heavy.....	44¢

Strictly Pure White Lead in Oil, in Kegs. In lots of  
 500 lb and upward, 79 ¢ ¢ ¢ in lots less than 500 lb  
 75¢ ¢ ¢ ¢ in 25-¢ cans, packed in 100-¢ cases  
 4¢, and 12½-¢ cans, 1¢ over keg price; in 1 to 5  
 cans, assorted, in 100-¢ cases, 2¢ over keg price.  
 Strictly Pure Dry White Lead in Kegs, 79 ¢ ¢ ¢  
 Strictly Pure Red extra bright and fine, in kegs.....  
 Strictly Pure Litharge, powdered, ext. fine, in kegs.....  
 Orange Mineral. True, in barrels, net 9 days and  
 not subject either to rebate or freight equaliza-  
 tion..... 80¢

# THE STANLEY



**MANUFACTURERS OF**

## Wrought Iron

### BUTTS, HINGES

AND

### DOOR

### BOLTS

**HART'S PATENT**

**79 CENTS**

**GOODS FURNISHED PLAIN, GALVANIZED**

**Also Manufacturers of THE POOR**

SUCCESSORS TO

**MALLEABLE**

Can be had

PATTERNS

G. W. VA

GOULDS

J. B. HOT

A. F. SHA

Manufacturers



## PHILADELPHIA BLACK

1324 to 1334 Callo

**R. B.**

### SUPERIOR BLACK

For melting Steel, Brass and other metals. Blast

manufacturer of Superior Quality Hamm

## LUMBUS WROUGHT

FOR BUTLERS' PANTRY AND KITCHEN. (Pat. A)

**COBS' MFG. CO., Sole Manu**

Orange Mineral, True, in 100-lb. kegs, net 60 days and not subject either to rebate or freight equalization.

**Terms:** Note or acceptance at 90 days; or less 2 1/2% for cash if paid within 15 days from date of invoice on lots of 500 lb. and over.

Freight equalized with all points where White Lead is made.

**Window Glass.**

Discount, 75 & Single Strength; 75 & 10% Double. Prices current. \* box of 50 feet.

Single Strength.

United States	Sizes.	A.A.	A.	B.	C.
25	6 x 8 to 10 x 15	\$8.75	\$8.00	\$7.50	\$7.00
30	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	16 x 34 to 24 x 36	12.25	10.75	9.00	8.00
60	20 x 28 to 34 x 36	13.00	11.50	9.75	8.50
70	26 x 36 to 30 x 44	14.50	13.25	10.75	9.50
80	26 x 40 to 30 x 54	15.00	14.00	11.25	10.00
84	30 x 52 to 30 x 54	.....	.....	.....	.....
90	30 x 50 to 34 x 56	.....	.....	.....	.....
94	34 x 58 to 34 x 60	.....	.....	.....	.....
100	36 x 60 to 40 x 60	.....	.....	.....	.....

**Double Strength.**

25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.50
30	11 x 14 to 15 x 24	14.50	13.25	12.50	11.25
48	16 x 24 to 20 x 28	17.25	15.75	14.00	12.50
54	16 x 34 to 24 x 36	19.75	17.25	14.50	13.00
60	20 x 28 to 34 x 36	21.00	18.50	15.75	14.00
70	26 x 36 to 30 x 44	23.25	21.25	17.25	15.50
80	26 x 40 to 30 x 54	24.00	22.50	18.00	16.00
84	30 x 52 to 30 x 54	25.75	23.25	19.25	17.00
90	30 x 50 to 34 x 56	27.25	25.00	21.75	19.50
94	34 x 58 to 34 x 60	29.25	27.75	24.00	21.50
100	36 x 60 to 40 x 60	31.25	30.00	27.75	24.50

Sizes above — 10% box extra for every 5 inches. An additional 10 percent will be charged for all glass more than 40 inches wide. All sizes above 5 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

**Hubbard & Co.'s Goods.**

Axes, Single Bit, Lippincott.....per doz., \$7.00  
 Axes, Double Bit, James & Co.....per doz., 6.50  
 Axes, Double Bit, Lippincott.....per doz., 12.00  
 Axes, Double Bit, James & Co.....per doz., 10.00  
 Brain Tools, Int.....do 20x7 1/2 & 5  
 Hoes, Planters' and Scovill Pattern.....do 60  
 Hoes, Handled, Square Eye, German.....do 60  
 Axes, Cross Cut, H. B. & Co., Champion, foot net, 80.25  
 Handles, Shovel, Bent, Bored, Riveted.....per doz., 2.00  
 Saws, Circular.....do 50  
 Saws, Long.....do 45  
 Saws, Cross Cut, H. B. & Co., Champion, foot net, 80.25  
 Saws, Cross-Cut, Lippincott, Champion, foot net, 80.25  
 Spades, Int.....do 20x7 1/2 & 5  
 Shovels, Int.....do 20x7 1/2 & 5  
 Scoops, Int.....do 20x7 1/2 & 5

**STANLEY WORKS**

**MANUFACTURERS OF**

**WAREHOUSE:**

**Chambers Street, New York.**

**JAPANESE, BRONZED AND NICKEL PLATED.**

**LOCKS, BRADS AND NAILS.**

**SAMSON JACK.**

**R & WOLFE**

**SAMSON JACK & PRESS CO.,**

**BLACK RIVER, N. Y.,**

**Manufacturers of**

**STEEL IRON WAGON JACKS.**

direct from us or from following Houses:

JOHN BROS., No. 27 Park Row, New York City.  
 N TINE & SON, No. 504 Commerce St. Philadelphia, Pa.  
 & AUSTIN, No. 167 Lake St., Chicago, Ill.  
 C. H. KINGS, Nashville, Tenn.  
 C. F. LEIGH & CANTWELL HDW. CO.,  
 No. 144 N. Main Street, St. Louis, Mo.

Manufactured in Three Sizes, of the Very Best Malleable Iron.

Warranted to lift any weight up to 7000 pounds.

SEND FOR ILLUSTRATED CATALOGUE.

**LEAD CRUCIBLE WORKS**

Whill St., Philadelphia, Pa.

**SEIDEL,**

MANUFACTURER OF

**LEAD CRUCIBLES.**

Registered Lead Stopper, &c., for Bessemer Steel Makers. A

selected Thermal Iron of different sizes and shapes.

**STEEL SINK.** AGENTS:

W. & B. DOUGLAS, Middlesex, Eng.

& N. Y. City. Agents for E.

England, N. Y. City and Exp.

# THE STANLEY WORKS

**MANUFACTURERS OF**

**Wrought Iron**

**BUTTS, HINGES**

AND

**DOOR**

**BOLTS**

**FACTORIES:**

New Britain,  
Connecticut.

**WAREHOUSE:**

79 Chambers Street, New York.

GOODS FURNISHED PLAIN, GALVANIZED, JAPANNED, BRONZED AND NICKEL PLATED.

Also Manufacturers of TACKS, BRADS AND NAILS

**THE SAMSON JACK.**

**POOR & WOLFF.**

SUCCESSORS TO SAMSON JACK & PRESS CO.,  
BLACK RIVER, N. Y.,  
Manufacturers of  
**MALLEABLE IRON WAGON JACKS.**

Can be had direct from us or from following Houses:

PATTERSON BROS., No. 27 Park Row, New York City.  
G. W. VAN TINE & SON, No. 504 Commerce St., Philadelphia, Pa.  
GOULDS & AUSTIN, No. 157 Lake St., Chicago, Ill.  
J. B. HOTCHKISS, Nashville, Tenn.  
A. F. SHAPLEIGH & CANTWELL HDW. CO.,  
No. 144 N. Main Street, St. Louis, Mo.

Manufactured in Three Sizes, of the Very Best Malleable Iron.

Warranted to lift any weight up to 7000 pounds.

SEND FOR ILLUSTRATED CATALOGUE.

**PHILADELPHIA BLACK LEAD CRUCIBLE WORKS**

1324 to 1334 Callowhill St., Philadelphia, Pa.

**BLACK CRUCIBLE**

**PULLEY**

**STEEL CRUCIBLE**

**R. B. SEIDEL,**  
MANUFACTURER OF  
**SUPERIOR BLACK LEAD CRUCIBLES.**

Forming Steel, Brass and other metals. Black Lead Stopper, &c. for Bessemer Steel Makers. Also manufacturer of Superior Quality Hammered Chemical Iron of different sizes and shapes.


**THE COLUMBUS WROUGHT STEEL SINK.**

Entirely new, being stamped from one plate of steel and superior to cast-iron sinks in every particular, being *lighter, stronger and more durable.*

These sinks, being made of wrought steel, will not break from heat, cold, or any cause *whatever.*

We furnish these sinks painted or galvanized, as desired, at prices—freedom from breakage considered—less than for sinks made from cast iron.

**FOR BUTLER'S PANTRY AND KITCHEN.** (Pat. April 12, 1881.)



AGENTS:

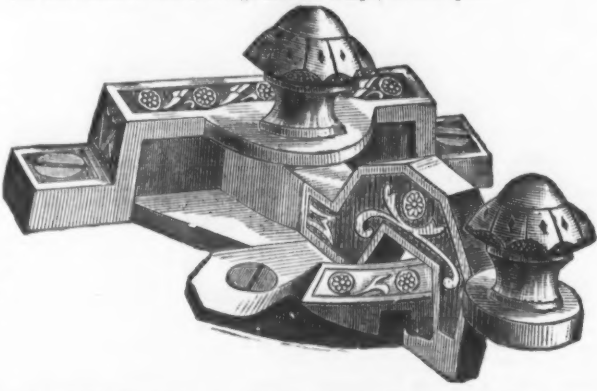
W. & B. DOUGLAS, Middletown, Ct. and N. Y. City.  
 England, N. Y. City and Export.  
 JAS. B. CLOW & SON, Chicago, Ill.  
 L. M. HUMPHREY MFG. CO., St. Louis, Mo.  
 BAILEY, FARRELL & CO., PHILADELPHIA, Pa.  
 MCINTOSH, GOOD & HURSTON, Cleveland, Ohio.  
 C. A. BLESSING, Philadelphia, Pa.  
 SIDNEY SHEPARD & CO., Buffalo, N. Y.  
 KENNEDY, SPAULDING & CO., Syracuse, N. Y.  
 GLEASON & BAILEY MFG. CO., Benson, Falls, N. Y.  
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 HARPER, RETHELDS & CO., Los Angeles, Cal.  
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 HOLBROOK, MERRILL & STETSON, San Francisco, Cal.

**THE KILBOURNE & JACOBS MFG. CO., Sole Manufacturers, COLUMBUS, OHIO**



For Net Bottom Prices see Page Adv. Iron Age, APRIL 15th.

**BROUGHTON'S**  
**BURGLAR-PROOF SASH LOCKS.**  
(Patented Oct. 7th, 1879.)  
FOR NET BOTTOM PRICES SEE PAGE AD.  
IN IRON AGE, APRIL 15th.

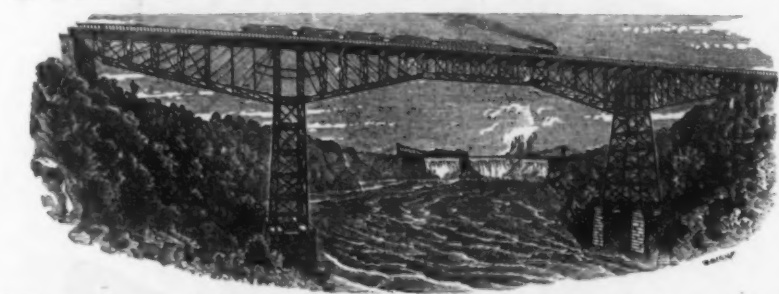


No. 210, Ornamental Iron, Iron Knob, fine finish, Etuscan Bronze.....	\$0.60	No. 21, Ornamental Iron, Iron Knob, Nickel-plated, Crimson Old Gold Inlaid.....	1.85
No. 211, Ornamental Iron, Iron Knob, fine finish, Olympian Bronze.....	.75	No. 218, Ornamental Iron, Iron Knob, Nickel-plated, Blue Old Gold Inlaid.....	1.00
No. 212, Ornamental Iron, Iron Knob, fine finish, Pompei Bronze.....	.85	No. 219, Ornamental Iron, Iron Knob, Nickel-plated, Green Old Gold Inlaid.....	1.95
No. 213, Ornamental Iron, Iron Knob, Nickel-plated.....	1.35	No. 220, Ornamental Iron, Iron Knob, Nickel-plated, Copper Old Gold Inlaid.....	2.00
No. 214, Ornamental Iron, Iron Knob, Nickel-plated, Rich Old Gold Inlaid.....	1.50	No. 221, Ornamental Iron, Iron Knob, Nickel-plated, Lemon Oil Gold Inlaid.....	2.05
No. 215, Ornamental Iron, Iron Knob, Nickel-plated, Pale Old Gold Inlaid.....	1.60	No. 222, Ornamental Cast Brass, Polished and Lacquered.....	2.65
No. 216, Ornamental Iron, Iron Knob, Nickel-plated, Fire Old Gold Inlaid.....	1.75	No. 223, Ornamental Cast Brass, Nickel-plated.....	3.50

**MANHATTAN HARDWARE CO.,**  
READING, PA., U. S. A.,  
MANUFACTURERS OF  
**LOCKS** of Every Description,  
AND A FULL LINE OF  
**GENERAL BUILDERS' HARDWARE.**

Special net prices to be found in *Iron Age* whenever changes occur.  
The only manufacturers in the United States who quote bottom prices to all dealers without favoring any class.  
Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order at very low prices: Pattern Making, Japanning, Bronzing, Tinning, &c.  
Our goods are known and liked wherever sold.  
Orders received will be filled at last prices quoted in *The Iron Age*.  
We do no underhand business, but quote alike to all for quantities less than \$1000.  
Our terms are strictly 15 days, f. o. b. Reading, no charge for cases or cartage.

**UNION BRIDGE COMPANY.**



Charles Kellogg, Thos. C. Clarke, C. S. Maurice, Geo. S. Field, Edmund Hayes, C. Macdonald.  
**CIVIL ENGINEERS**  
And Constructors of Iron and Steel Bridges, Viaducts, Roofs, Elevated Railroads, Marine Piers, Etc.

Works: Athens, Pa. Works: Buffalo, N. Y.  
Late Kellogg & Maurice. Capacity, 14,000 tons. (Late Central Bridge Works.) Capacity, 12,000 tons.  
DESIGNS AND ESTIMATES WILL BE SENT ON APPLICATION TO

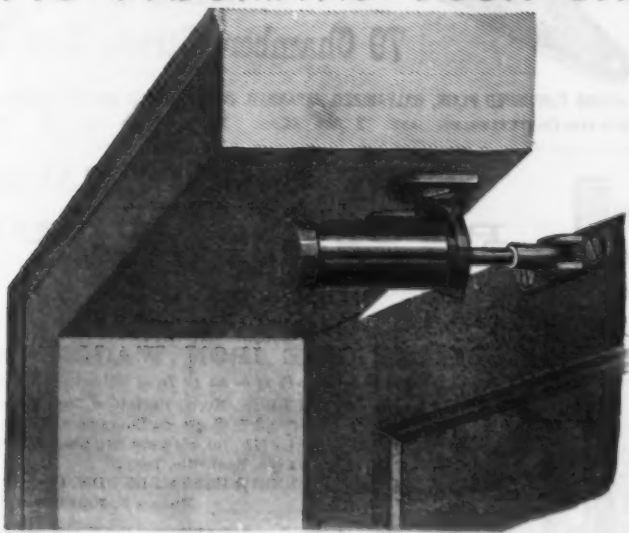
**UNION BRIDGE COMPANY, 18 Broadway, New York.**

**WATTS + MANUFACTURING + CO.**

480 PEARL STREET, NEW YORK,

SOLE MANUFACTURERS OF THE

**WATTS PNEUMATIC DOOR CHECK.**



The Latest Improved, Most Simple and Only Reliable Door Check  
Now on the Market.

It can be applied to either side of the Door or on the casing overhead. In fact, the only universal Air Door Check made that can be sold over the counter, not requiring an expert to put it on. Can be applied by anybody, and are sold at a less price than other Checks. Catalogues and Price Lists furnished on application.

**NEW ENGLAND SPECIALTY CO.**

North Easton, Mass.,

**THE ALFORD & BERKELE CO.,** Agents, 77 Chambers St., N. Y.



MANUFACTURERS OF

**LEAVITT'S IMPROVED SCREW DRIVERS,**

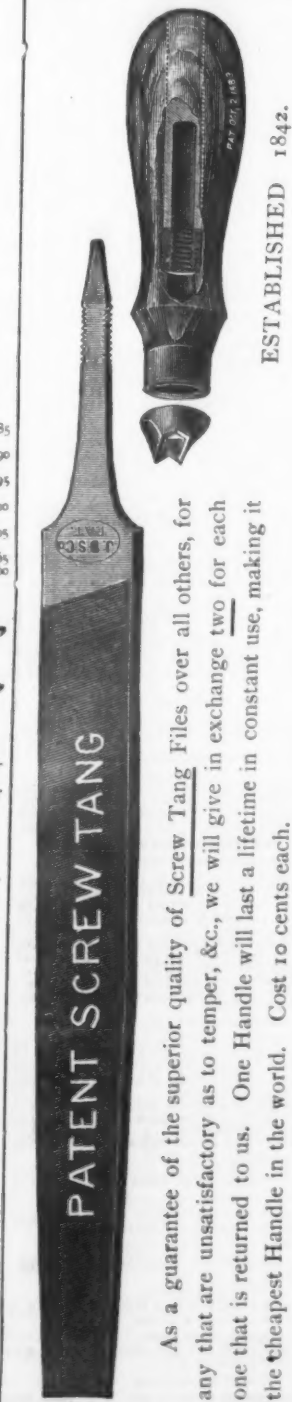
With Barbed Tang. (Patent applied for.)

**LEAVITT'S PATENT COMMON SENSE CAN OPENER**

Patented Novelties and Hardware Specialties.

**SHEET METAL PUNCHING TO ORDER.**

Double Acting Spring **BUTTS** SABIN'S LEVER DOOR SPRINGS,  
Coil, and Sabin's Volute Springs  
For various purposes made to order.  
**SABIN MACHINE CO., Montpelier, Vt.**



PATENT SCREW TANG

As a guarantee of the superior quality of Screw Tang Files over all others, for any that are unsatisfactory as to temper, &c., we will give in exchange two for each one that is returned to us. One Handle will last a lifetime in constant use, making it the cheapest Handle in the world. Cost 10 cents each.

ESTABLISHED 1842.

**J. BARTON SMITH CO.,**

Philadelphia, Pa., U. S. A.

GILBERT PARKER, President.

S. A. HAINES & CO., Agents, 90 Chambers St., New York.

**BOSTON.**

Reported by Bigelow & Douse.

**Ammunition.**

Cartridges—  
Rim Fire Cartridges..... \$15.00  
Rim Fire Military Cartridges..... \$15.00  
Rim Fire Cartridges, Military and Sporting..... \$15.00  
Rim Fire Cartridges, except 22 and 25 cal., an additional 10% over above discounts.  
Blank Cartridges, 22 cal..... \$1.50  
Blank Cartridges, 25 cal..... \$3.00  
Primed Shells and Bullets..... \$1.50  
R. B. Caps, Round Ball..... \$1.50  
R. B. Caps, Conical Ball, Swaged..... \$1.75

**Primers.**

Remington Primers, all sizes, and B. L. Caps (for Sturtevant Shells)..... \$1.00  
All other Primers, all sizes..... \$1.10

**Shells.**

Paper Shot Shells, 1st and 2d or S. G. qual..... \$25.50  
Paper Shot Shells, Club, Rival, Climax..... \$40.50  
Paper Shot Shells, Star Brand..... \$50.50  
Brass Shot Shells, 1st quality..... \$15.00  
Brass Shot Shells, Club, Rival and Climax..... \$15.00

**Wads.**

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U. M. C. & W. R. A.—R. E. 1 & 2..... \$4.50

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\$3.25; 2, \$4.00; 3, \$4.50; 4, \$5.00; 5, \$5.50; 6, \$6.00; 7, \$6.50;  
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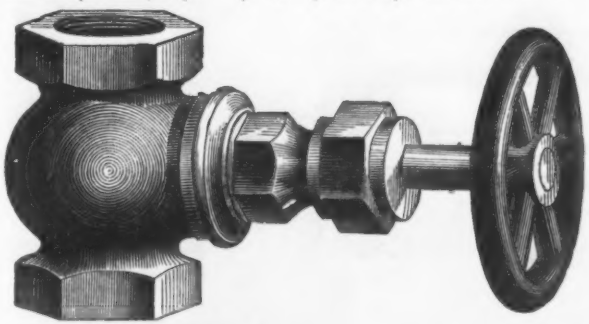
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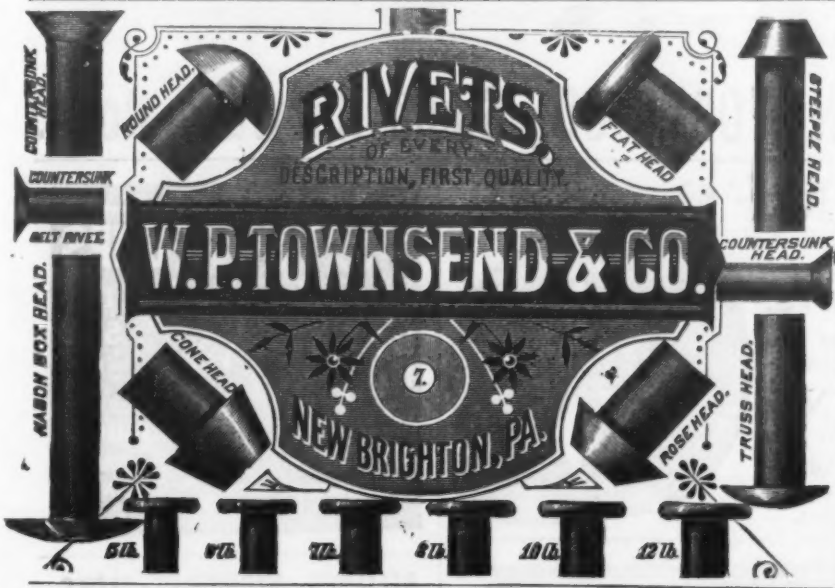
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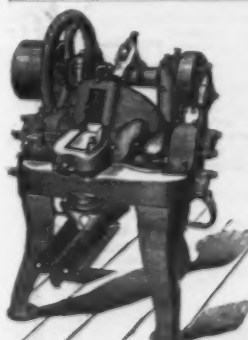
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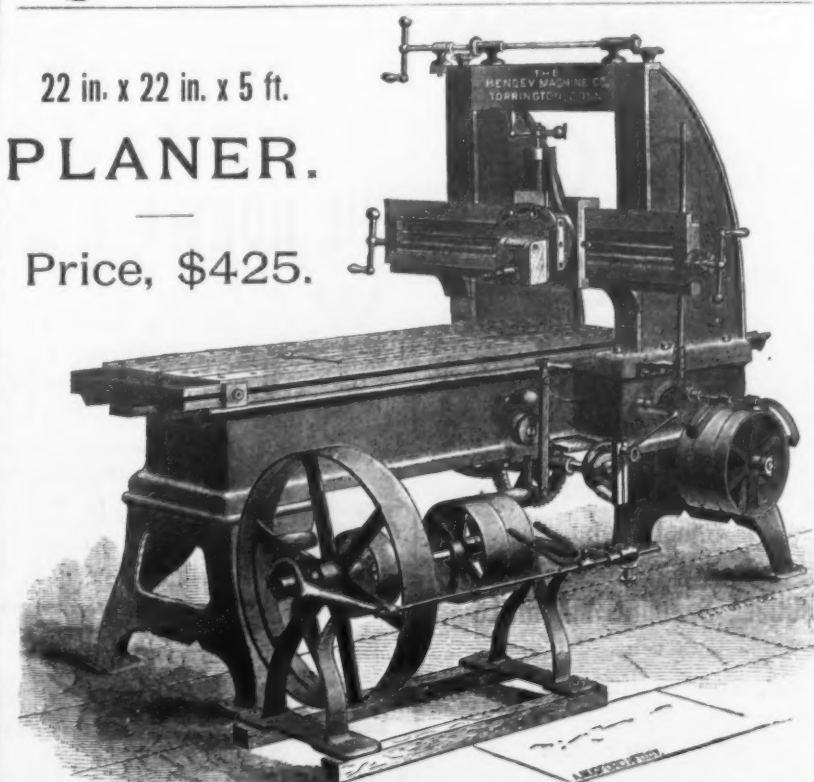
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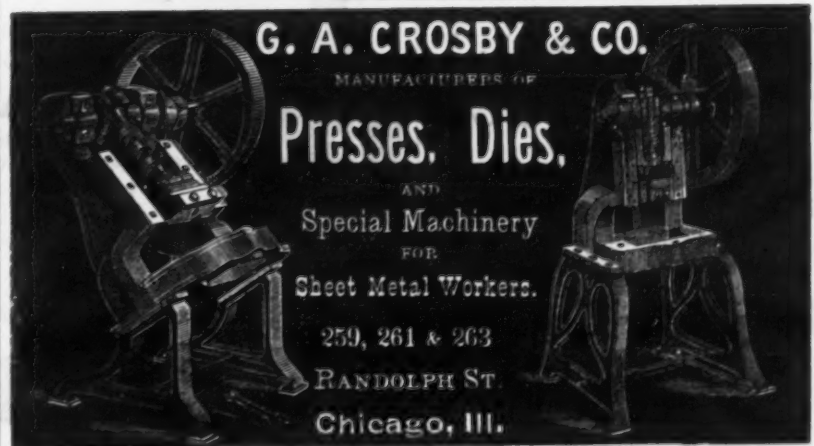
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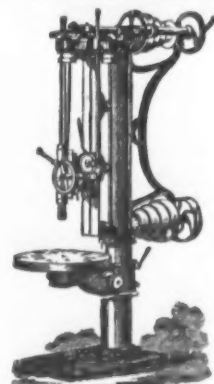
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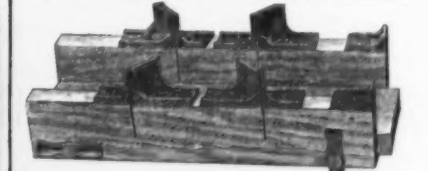
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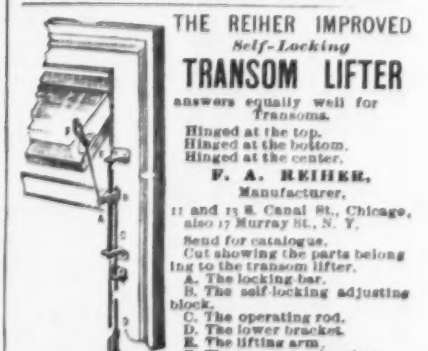
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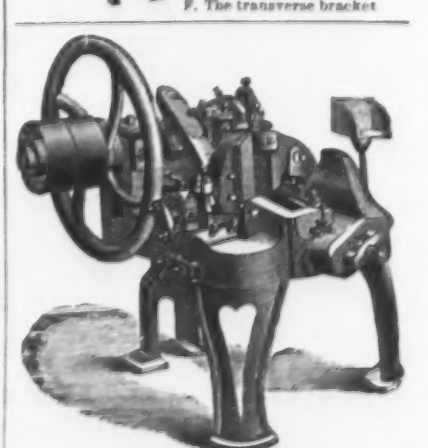
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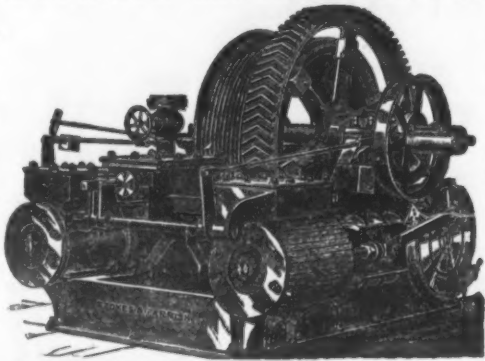
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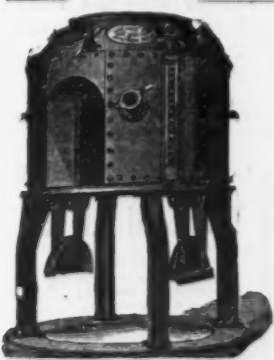
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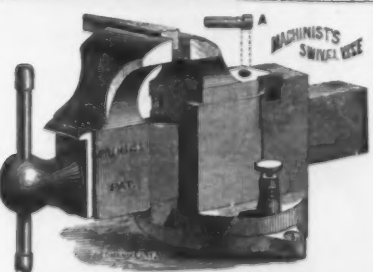
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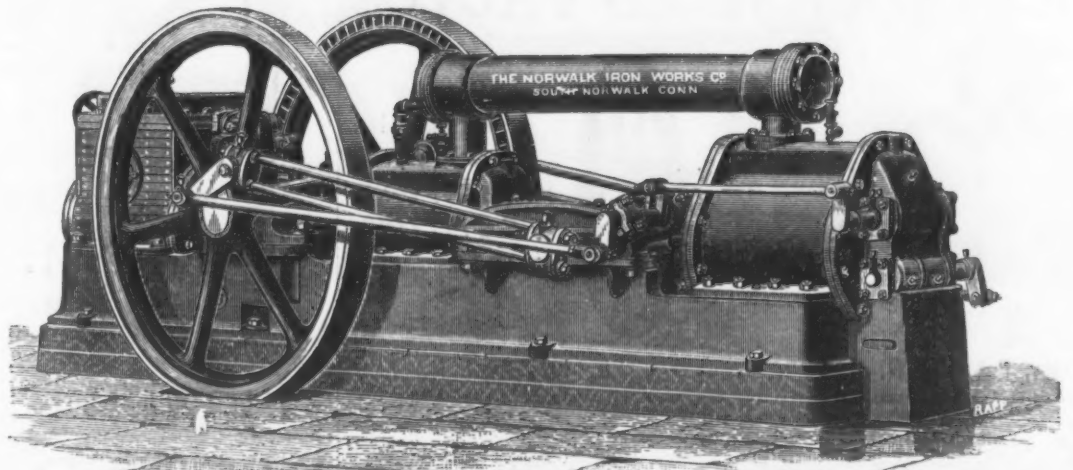
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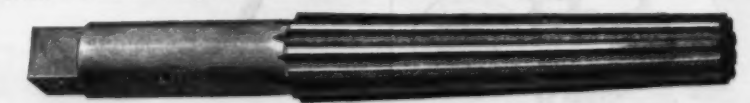
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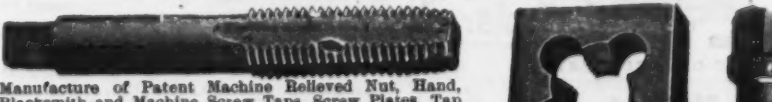
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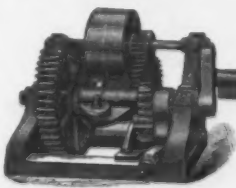
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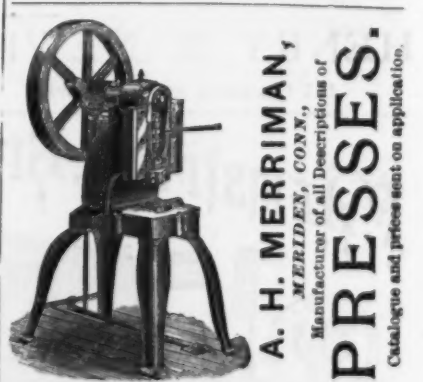
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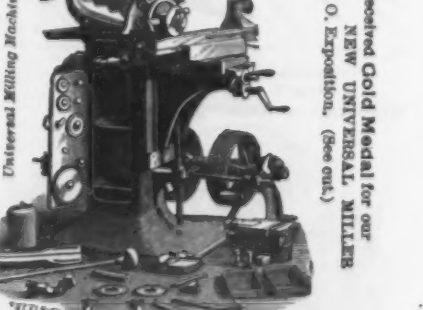
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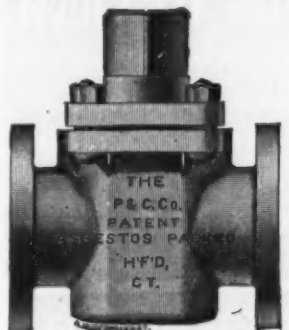
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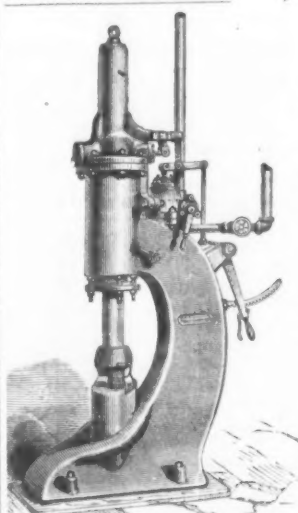
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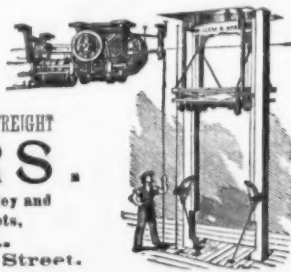
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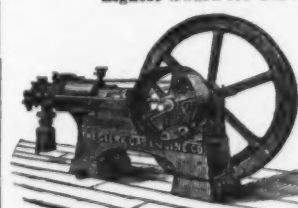
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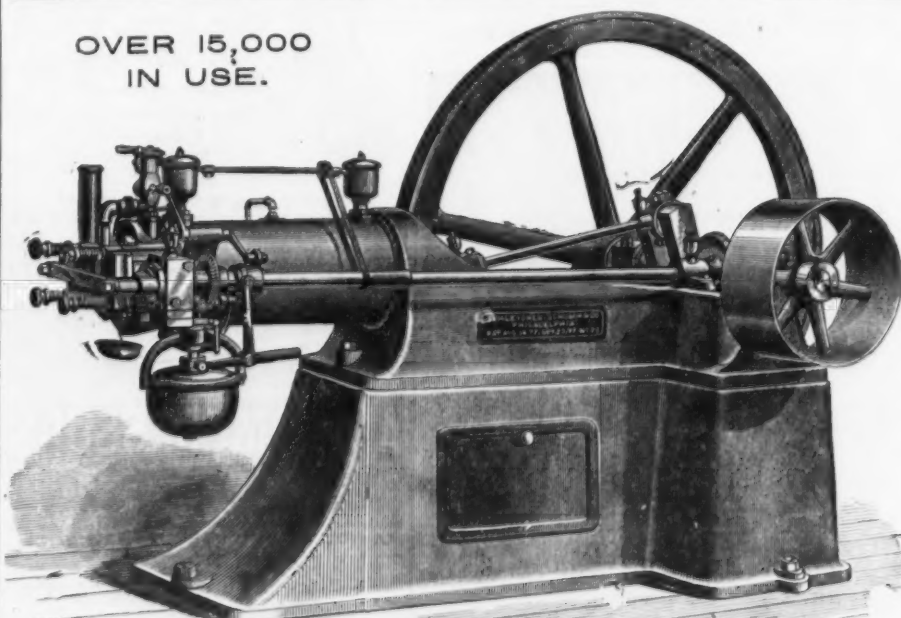


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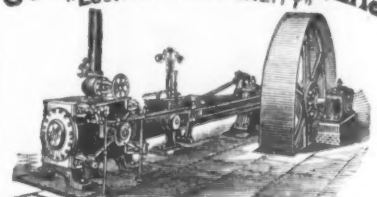


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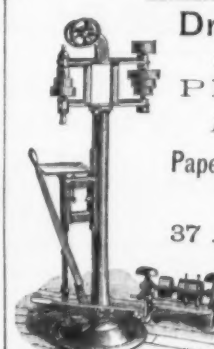
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